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JANUARY 8, 1900

A SYNOPSIS OF MEXICAN AND CENTRAL
AMERICAN UMBELLIFERÆ

BY

JOHN M. COULTER AND J. N. ROSE .

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A SYNOPSIS OF MEXICAN AND CENTRAL AMERICAN UMBELLIFERÆ.

BY JOHN M. COULTER AND J. N. ROSE.

THE Mexican and Central American Umbelliferæ were first brought together by Mr. W. B. Hemsley in the *Biologia Centrali-Americana*. The fascicle containing them was published in 1880, and the Supplement, including some additions, in 1886. This pioneer work was one of great difficulty, and has been an invaluable assistant to us in the further study of the Umbelliferæ of the region. In that enumeration twenty-five genera are recognized and seventy-six native species named, thirty-two of which belong to the genus *Eryngium*. Four of these genera are now to be excluded from the Mexican flora, viz., *Carum*, *Cymopterus*, *Eulophus*, and *Smyrnum*, leaving twenty-one of the Hemsley genera that are to be retained.

Since 1886 the following new genera from this region have been described, the number of species indicated including those described in the present paper: *Coaxana* (1 species), *Coulterophytum* (4 species), *Deanea* (7 species), *Donellsmithia* (1 species), *Enantiophylla* (1 species), *Museniopsis* (19 species), *Myrrhidendron* (1 species), *Nogoezia* (3 species), *Neonelsonia* (2 species), *Prionosciadium* (15 species), and *Rhodosciadium* (3 species). *Apiastrum*, *Conioselinum*, *Musineon*, and *Pimpinella* have also been found to be members of the Mexican flora; and to these should be added *Ammoselinum*, *Caucalis* and *Leptocaulis*, whose species Hemsley had included under other

genera. These eighteen genera have added sixty-four species to the flora of the region under consideration, while numerous species have been added to other genera, notably to *Eryngium*, *Tauschia*, and *Arracacia*. The Umbelliferæ of Mexico and Central America, therefore, are now known to include thirty-nine genera and one hundred and eighty-two native species, which more than doubles the species known in 1886. It is also of interest to note that ten of the genera and one hundred and forty-eight of the species are endemic.

Certain features of geographical distribution have become evident, but exploration must be more complete before they can become very definite. There are very few Umbelliferæ in the tropical zone of Mexico and Central America, their chief development being in the mountains of the Upper Austral and Transition zones, in such dominant forms as *Eryngium*, *Arracacia*, *Prionosciadium*, *Tauschia*, *Coulterophytum*, and *Rhodosciadium*, the Sierra Madre region having proved most productive of new forms. It is also a matter of interest that the great dominant genus of the Western United States, *Peucedanum*, with its 60 or 70 species, is probably not represented at all south of the Mexican boundary.

In the *Contributions of the National Herbarium* (3: 289-309. 1895) we gave an account of new and noteworthy species, largely bringing together the knowledge of the group which had accumulated since Hemsley's account of 1880. Since 1895, however, exploration has proceeded rapidly, and many new collections have not only contributed numerous new species, but have also thrown much light upon certain genera and doubtful species. The recent collections which have contributed chiefly to our knowledge are as follows:

The veteran collector Mr. C. G. Pringle, whose annual sets of Mexican plants for twenty years have been among the most valuable additions to herbaria, in recent years has been working chiefly in the general region of the City of Mexico, which has been made accessible by the opening up of new railway lines.

Messrs. E. W. Nelson and E. A. Goldman, field naturalists of the Biological Survey of the U. S. Department of Agriculture, have collected over a more extensive area than any others,

bringing to light not only new forms of Umbelliferæ, but of numerous other groups as well.

In 1897, Dr. J. N. Rose spent four months in Mexico, collecting a series of 57 numbered specimens of Umbelliferæ, chiefly in the Sierra Madre of Durango, Zacatecas, Jalisco, and Tepic, 21 of which have proved to be new. In 1899 also Dr. Rose spent three months in Southern Mexico, collecting Umbelliferæ about Cuernavaca in Morelos, Pachuca in Hidalgo, and Guanajuato. The Pachuca collections are of special interest as they include certain little known species of Humboldt and Thomas Coulter from the type localities.

GENERA GIVEN BY HEMSLEY.

Genus.	No. of species in Hemsley	No. of species added since	No. of species transferred	No. of species recognized	No. of endemic species
Angelica	1	4	1	4	4
Apium	3	0	2	1	0
Arracacia	5	19	3	20	20
Astericum	1	0	0	1	1
Berula (Sium)	1	0	0	1	0
Bowlesia	1	1	0	2	0
Carum	0	0	0	0	0
Cicuta	1	1	1	1	1
Cymopterus	1	0	1	0	0
Daucus	3	0	0	3	1
Eryngium	32	20	0	52	43
Eulophus	2	0	2	0	0
Hydrocotyle	7	1	0	8	1
Ligusticum	1	2	1	2	2
Lilæopsis (Crantzia)	1	1	1	1	0
*Micropleura	1	0	0	1	1
Enanthe	0	1	0	1	1
Oreomyrrhis	3	0	2	1	0
Osmorhiza	1	1	1	1	1
Ottoa	1	0	0	1	0
Peucedanum	3	1	2	2	2
Sanicula	2	1	0	3	1
Smyrnum	1	0	1	0	0
Spananthe	2	0	1	1	0
Tauschia	2	10	1	11	10
Totals,	76	63	20	118	89

Dr. T. Altımarano, Director of the Medical Institute of Mexico, has also been of much service in contributing specimens, chiefly from the mountains about the Valley of Mexico.

In the present paper this new material is published, and also revisions of certain genera which are now better understood. One of the most interesting facts is the great increase in our knowledge of *Prionosciadium*, a genus established in 1888 as containing three species, which recent collections have increased to fifteen. The largest genus of the region, *Eryngium*, is now being studied by Mr. Hemsley. His descriptions of several new species, published in Hooker's *Icones*, are herein translated and republished, together with tracings of the plates, made by Miss Anna Snyder. The genus *Arracacia* also has received large additions, seven new species being described in the present paper, and others previously. The genus, however, has lost several species to *Tauschia*, the generic boundary between the two being more definitely understood. It is also of interest to

GENERA ADDED SINCE HEMSLEY.

Genus.	No. of species	No. of endemic species.	No. of species cited by Hemsley under other genera
<i>Ammoselinum</i>	1	1	1 (<i>Apium</i>).
<i>Apiastrum</i>	1	0	
<i>Caucalis</i>	1	0	1 (<i>Daucus</i>).
* <i>Coaxana</i>	1	1	
<i>Conioselinum</i>	1	1	
* <i>Coulterophytum</i>	4	4	
* <i>Deanea</i>	7	7	
* <i>Donnellsmithia</i>	1	1	
* <i>Enantiophylla</i>	1	1	
<i>Leptocaulis</i>	1	0	1 (<i>Apium</i>).
<i>Musenopsis</i>	19	18	2 (<i>Eulophus</i>).
<i>Musineon</i>	1	1	
* <i>Myrrhidendron</i>	1	1	
* <i>Neogoezia</i>	3	3	2 (<i>Oreomyrrhis</i>).
<i>Neonelsonia</i>	2	1	1 (<i>Arracacia</i>).
<i>Pimpinella</i>	1	1	
* <i>Prionosciadium</i>	15	15	3 (<i>Angelica</i> , <i>Peuce-</i>
* <i>Rhodosciadium</i>	3	3	[<i>danum</i>].
Totals,	64	59	

note that the recent genus *Neonelsonia*, founded upon a single species, has been strengthened by the discovery of a species heretofore referred to *Arracacia*.

The accompanying tables will serve to show the development of our knowledge of the Umbelliferæ of the region since Hemsley's presentation of the family in the *Biologia*. The numbers given include only the native and named species. The endemic genera are indicated by asterisks.

The genera are arranged in the sequence given by Drude in Engler and Prantl's *Natürlichen Pflanzenfamilien*, which is by far the most masterly presentation of the group which has yet appeared. The following purely artificial key to the genera may be of service to those not familiar with them.

Artificial Key to the Genera.

Flowers in dense heads; leaves usually with bristly or spiny-toothed margins..... 7. *Eryngium*.

Flowers not in heads, evidently umbellate; leaves not spiny-toothed. Fruit conspicuously bristly.

Fruit covered with hooked bristles.

Leaves palmately divided, with broad segments.

6. *Sanicula*.

Leaves ternately dissected, with filiform segments.

21. *Leptocaulis*.

Fruit with bristles only on the ribs.

Bristles barbed at tip; stylopodium obsolete.

39. *Daucus*.

Bristles not barbed; stylopodium conical...9. *Caucalis*.

Fruit not bristly (except *Osmorhiza*).

FLOWERS IN SIMPLE UMBELS (sometimes proliferous or even irregularly branching in *Hydrocotyle*).

Fruit more or less stellate-pubescent.....3. *Bowlesia*.

Fruit not stellate-pubescent.

Seed-face more or less sulcate or involute.

Fruit narrow.....10. *Oreomyrrhis*.

Fruit orbicular.....11. *Neogoezia*.

Seed-face not sulcate or involute.

Stems creeping..... 1. *Hydrocotyle*.

Stems more or less erect and leafy.

Leaves cuneate at base 5. *Astericum*.

Leaves not cuneate at base.

Leaves with naked petioles and reniform blades.

2. *Micropleura*.

Leaves with tuft of hairs at top of petiole, and ovate acuminate blades.....4. *Spananthe*.

FLOWERS IN COMPOUND UMBELS.

Fruit flattened laterally.*Seed-face more or less deeply sulcate.*

Fruit elongated and narrow, tapering into a stipe-like base.

Lateral ribs not winged; fruit bristly.

8. *Osmorhiza*.

Lateral ribs winged; fruit not bristly.

36. *Coulterophytum*.

Fruit oblong to orbicular, not tapering at base.

Leaves reduced to fistulous, nodose petioles.

19. *Ottoa*.

Leaves not reduced, more or less compound.

Stylopodium conical.

Fruit cordate in outline, deeply notched at base and didymous....13. *Neonelsonia*.Fruit oblong to ovate, not deeply notched or didymous.....18. *Arracacia*.

Stylopodium obsolete.

Fruit with conspicuous obtuse ribs.

17. *Tauschia*.

Fruit with slender and more or less indistinct ribs.

Styles long and ribbon-like.

15. *Musineon*.

Styles short and filiform.

Stems simple; leaflets broad; Guatemalan.....14. *Donnellsmithia*.

Stems mostly branching; leaflets narrow; Mexican.

Oil-tubes numerous.

16. *Museniopsis*.

Oil-tubes solitary.

12. *Apiastrum*.*Seed-face plane.*

Leaves reduced to fistulous, nodose petioles.

27. *Lilaopsis*.

Leaves not reduced, more or less compound.

Fruit winged.....29. *Coaxana*.

Fruit not winged.

Fruit with prominent acute ribs.

28. *Ligusticum*.

Fruit with obtuse or obscure ribs.

Fruit with conspicuous, obtuse and corky ribs.

Stylopodium conical.....23. *Cicuta*.

Stylopodium obsolete.

Fruit very small, strongly flattened laterally; leaflets filiform (in the native species).

20. *Apium*.Fruit larger, slightly flattened laterally; leaflets broad.....26. *Enanthe*.

- Fruit with obscure ribs.
 Fruit somewhat scabrous....22. *Ammoselinum*.
 Fruit smooth.
 Involucre and involucels conspicuous.
 25. *Berula*.
 Involucre and involucels not conspicuous (in
 the native species).....24. *Pimpinella*.
Fruit flattened dorsally.
 Seed-face sulcate.
 Stylopodium obsolete.....32. *Prionosciadium*.
 Stylopodium conical34. *Deanea*.
 Seed-face plane.
Fruit linear or oblanceolate in outline; Guatemalan.
 Fruit linear; arborescent.....37. *Myrrhidendron*.
 Fruit oblanceolate; perennial herbs.
 35. *Enantiophylla*.
Fruit orbicular or nearly so.
 Stylopodium low conical.
 Dorsal and intermediate ribs filiform.
 33. *Rhodosciadium*.
 Dorsal and intermediate ribs prominent.
 Leaves with rather large ovate or lanceolate seg-
 ments.....31. *Angelica*.
 Leaves with small segments..30. *Conioselinum*.
 Stylopodium obsolete.....38. *Peucedanum*.

1. HYDROCOTYLE L. Sp. Pl. 1: 234. 1753.

The genus has a world-wide distribution, and in Hemsley's catalogue eight species, seven of which are named, are enumerated as occurring in the Mexican and Central American region, as follows: *H. bonplandi* Rich., *H. bonariensis* Lam., *H. interrupta* Muhl., *H. mexicana* Cham. & Schlecht., *H. prolifera* Kellogg, *H. pusilla* Rich., and *H. ranunculoides* L. Some of these are perhaps to be excluded, and *H. umbellata* and probably other species are to be added. Of these *H. mexicana* is the only endemic species.

Hydrocotyle bonariensis Lam. Encycl. 3: 153. 1789.

Tamaulipas: sand dunes at Tampico, *Pringle* 6359; Alta Mira, *E. A. Goldman* 94, April 20, 1898.

Oaxaca: Tehuantepec City, altitude 45 meters, *Nelson* 2620, May 29, 1895.

Hydrocotyle mexicana Cham. & Schlecht. Linnæa 5: 208. 1830.

Chiapas: about Tumbala, altitude 1200-1650 meters, *Nelson* 3301, October 20-29, 1895.

Guatemala: near Nenton, altitude 900-1200 meters, *Nelson* 3623, December 13, 1895; Volcano Santa Maria, altitude 2400-3450 meters, *Nelson* 3702, January 24, 1896.

Costa Rica: altitude 2000 meters, *Tonduz* 4274, July 10, 1891;
Tonduz 7677, March 1893; *Tonduz* 8258, November 1893.

Hydrocotyle ranunculoides L. f. Suppl. 177. 1781.

Durango: near city of Durango, *Palmer* 216, May 5-June 24, 1896.
 Costa Rica: San Jose, *Tonduz* 1688, December 1889.

Hydrocotyle umbellata L. Sp. Pl. 1: 234. 1753.

Tepic: near town of Tepic, *Nelson* 4175, April 9, 1897.
 Costa Rica: Aguacalienta, *Pittier*, May 2, 1890.

2. MICROPLEURA Lag. in Ocios Esp. Emigr. 4: 347. 1825.

A genus of a single species, endemic in the Mexican and Central American region. Both Urban and Drude refer the genus to *Centella*, recently separated again from *Hydrocotyle*, but in our judgment it should be kept distinct. It is restricted to the high mountains, while *Centella*, at least our American species, belongs to the low ground.

Micropleura renifolia Lag. l. c.; also Obs. Aparas. 15. 1826.

Centella renifolia (Lag.) Urban in Mart. Fl. Bras. 11: 286. 1879.

Oaxaca: San Felipe, *Rose* 4609, June 16-21, 1899.

Chiapas: above San Cristobal, altitude 2100-2400 meters, *Nelson* 3145, September 18-22, 1895.

Tepic: on the mountain between Dolores and Santa Gertrudis,
Rose 2056, August 7, 1897.

3. BOWLESIA Ruiz. & Pav. Prod. Fl. Peruv. 44. pl. 34. 1794.

Chiefly a South American genus, but two species extending into our region. In addition to *B. lobata* Ruiz. & Pav., given by Hemsley, we cite the following:

Bowlesia palmata Ruiz. & Pav. Fl. Peruv. 3: 28. pl. 251. 1802.

Chihuahua: under cliffs, canyons of the Sierra Madre, *Pringle* 1248, October 3, 1887.

4. SPANANTHE Jacq. Collect. 3: 247. 1789.

A genus extending from the Mexican and Central American region into Tropical South America. Hemsley gives the following two species: *S. angulosa* Turcz. and *S. paniculata* Jacq., but, as he remarks, the former is probably a variety if not merely a form of the latter.

Spananthe paniculata Jacq. Coll. 3: 247. 1789.

Vera Cruz: in fields near Orizaba, altitude 1200 meters, *Pringle* 6231, October 31, 1895.

Guatemala: along roadside between Nenton and Jacaltenango, altitude 1050-1590 meters, *Nelson* 3565, December 18, 1895.

Costa Rica: altitude 1200 meters, *Pittier* 19, December 12, 1887; *Pittier* 431, August 1888; *Tonduz* 431, August 12, 1889; *Tonduz* 7118, July 1892; altitude 1500 meters, *Pittier* 6980, August 28, 1892.

5. *ASTERICIUM* Cham. & Schlecht. Linnæa 1: 254. 1826.

A South American genus, represented in our region by the single endemic species *A. flexuosum* Hemsley, collected but once, and with immature fruit, by *Bates* in "South Mexico."

6. *SANICULA* L. Sp. Pl. 1: 235. 1753.

A genus of about thirty species, belonging to both hemispheres, three of which belong to our region, *S. liberta* Cham. & Schlecht. and *S. mexicana* DC., both cited by Hemsley, the former being endemic, and *S. bipinnatifida* Dougl., a Pacific Coast species extending into Lower California.

Sanicula mexicana DC. Prod. 4: 84. 1830.

Vera Cruz: near Jalapa, altitude 1200 meters, *Pringle* 8061, April-May 1899.

Chiapas: above San Cristobal, altitude 2100-2640 meters, *Nelson* 3210, September 18-22, 1895; along the road between Tenejapa and Yajalon, altitude 900-1500 meters, *Nelson* 3245, October 13, 1895.

Guatemala: Volcano of Santa Maria, altitude 2400-3450 meters, *Nelson* 3705, January 24, 1896.

Costa Rica: *Pittier* 255, May 27, 1888; altitude 2000 meters, *Tonduz* 255, August 31, 1889; altitude 2000 meters, *Pittier* 4272, July 1891; *Tonduz* 7676, March 1893.

Sanicula bipinnatifida Dougl. in Hook. Fl. Bor. Am. 1: 258. pl. 92. 1834.

Lower California: near Ensenada, *Jones* 3690, April 10, 1882.

7. *ERYNGIUM* L. Sp. Pl. 1: 232. 1753.

A genus of about two hundred species, distributed chiefly throughout temperate and subtropical regions, and especially abundant in America. Hemsley, in 1880, enumerated thirty-seven species, five of them without names, and has now about completed a revision of the Mexican and Central American species of the genus, involving numer-

ous changes. Since 1880 the following species have been published, in addition to those republished below: *E. alternatum* C. & R., *E. columnare* Hemsl., *E. involucreatum* C. & R., *E. lemmoni* C. & R., *E. leptopodium* Hemsl., *E. madreense* Watson, *E. mexicanum* Watson, *E. montanum* C. & R., *E. nelsoni* C. & R., *E. reptans* Hemsl., *E. schaffneri* Hemsl., *E. seatonii* C. & R., and *E. tenuissimum* Hemsl. At the present date, therefore, the published species of the region have increased in number to fifty-two, forty-three of which are endemic.

The following species described by Hemsley in Hooker's *Icones* are founded upon material furnished by the National Herbarium. The plates are reproduced through the courtesy of the Director of Kew Gardens.



FIG. 1. *Eryngium cryptanthum*.

Eryngium cryptanthum Hemsl.
in Hook. Icon. IV. 6: pl.
2509. 1897. Fig. 1.

E. beecheyanum Seem. Bot. Voy.
Herald 294. 1856, not Hook. & Arn.

Biennial (?), glabrous throughout; stem erect, slender, 1.5 to 4 dm. high, sparsely branched at base, the branches erect and dichotomous or trichotomous; leaves thin, scarcely coriaceous; basal ones rosulate, sessile, 2.5 to 5 cm. long, oblong-spatulate, spinulose-dentate, with white margin; stem leaves smaller, few-lobed; heads few, on slender peduncles, small, ovoid, the largest about 6 mm. long with out the bracts; involucre of 5 to 7 rather rigid, spinulose, lanceolate bracts, 6 to 10 mm. long, enclosing the flowers, mostly 2-toothed at the middle; involucels

of acute bractlets broad at base and a little exceeding the flowers; calyx-teeth minute, ovate, minutely apiculate, at length incurved; carpels oblong, 1 to 1.5 mm. long, regularly and completely spongy-scaly, with divaricate styles; oil-tubes minute, 1 or 2 or none in the intervals, 2 on the commissural side.

Northwest Mexico: in the Sierra Madre, *Seeman* 2135.

Eryngium galeottii Hemsl. in Hook. Icon. IV. 6: *pl.* 2510. 1897.

Plate III. a.

E. microcephalum Willd.? Hemsl. Biol. Centr.-Am. Bot. 1: 563. 1880.

E. ghiesbreghtii C. & R. Contr. Herb. 3: 299. 1895, not Decne.

Perennial (?), glabrous, nearly unarmed, from a cylindrical tuberous root; stem almost simple, slender, 4 to 6 dm. high, bearing 1 to 3 heads; leaves thick, subcoriaceous, scarcely rigid; basal ones with very long petioles, lanceolate, acuminate, rounded at base, crenate-dentate, including the petiole 12.5 to 17.5 cm. long; upper leaves sessile, narrow, gradually smaller upward, aculeate-dentate, bract-like; heads erect on slender peduncles, globose or oblong, without the bracts about 12 mm. in diameter; involucre of 5 to 7 rigid, lanceolate, acute and pungent bracts, often aculeate-dentate with 2 to 6 unequal teeth, 6 to 12 mm. long; involucels of narrow, almost subulate, pungent and incurved bractlets a little exceeding the flowers; calyx-lobes oblong-lanceolate, long cuspidate-acuminate; styles elongated and divaricate; carpels (immature) subtriangular, scaly throughout.

Oaxaca: altitude 2100-2400 meters, *Galeotti* 2767; *Pringle* 4746, in 1894; *A. L. Smith* 877.

Nearest *E. paucisquamosum*, but differs in the lanceolate leaves and aculeate-dentate involucral bracts. Schlechtendal & Chamisso (*Linnaea* 5: 207. 1830) reduce *E. microcephalum* Willd. to *E. bonplandii* Delar., which differs from *E. galeottii* in its small ovate-oblong leaves, very short entire bracts, papillose carpels, and remarkably long, reflexed styles. *E. ghiesbreghtii* Decne. differs in its cordate leaves.

Eryngium longipetiolatum Hems.

in Hook. Icon. IV. 6: *pl.*

2504. 1897. Fig. 2.

Perennial (?), glabrous throughout, wholly unarmed, from a thick fibrous root; stem erect, with few branches, leafy, 3 to 7.5 dm. high, bearing few heads; basal and lower leaves

with long petioles (sometimes reaching 25 cm.), thickish, narrowly ovate-oblong, without the petiole 2.5 to 9 cm. long, 2 to 3.5 cm. broad, obtuse or rounded at apex, cuneate at base, truncate-crenate

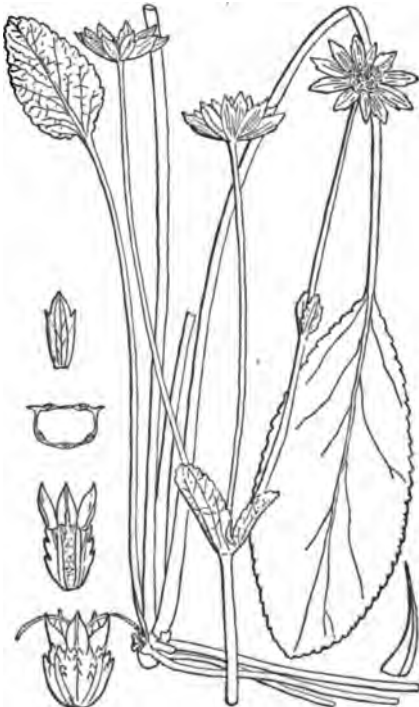


FIG. 2. *Eryngium longipetiolatum*.

and with white margin; upper stem leaves sessile, auriculate at base, clasping, gradually smaller upward; heads in threes, or solitary on the lateral branches, long peduncled, hemispherical, shorter than the bracts; involucre of 9 to 12 rigid, narrow oblong bracts, 6 to 12 mm. long, mostly rounded at apex, very short spinose, mostly with 2 spinose teeth above the middle, with rarely 2 or 3 additional teeth; involuclers of subulate incurved bractlets from a broad base, at length rigid, exceeding the flowers; calyx-teeth narrow, ovate, subspinose-apiculate; carpels about 2 mm. long, covered mostly above the middle with acute scales; styles elongated, recurved; oil-tubes small, mostly 5, of which 2 are on the commissural side.

Chiapas: near San Cristobal, altitude 2100-2640 meters, *Nelson* 3151, in 1895.

A species intermediate between *E. longirameum* and *E. scaposum*, differing in its long-petioled, oblong basal leaves, cuneate at base.

Eryngium paucisquamosum Hemsl. in Hook. Icon. IV. 6: *pl.* 2505. 1897. Plate III *δ*.

Perennial, apparently stoloniferous, glabrous throughout; stem erect, very slender, 2 to 6 dm. high, almost naked, bearing 3 to 5 heads; leaves thick, somewhat fleshy; basal and lower ones long-petioled, oblong or elliptical, without the petiole 3.5 to 4.5 cm. long, slightly cordate at base, rounded at apex, crenulate and margined, conspicuously veiny beneath, on a slender petiole 5 to 7.5 cm. long; upper leaves few, sessile, narrower, half-clasping; heads mostly 3 to 5, subglobose, 6 to 8 mm. in diameter, on slender peduncles, lateral peduncles bibracteate near the middle, terminal peduncles naked; involucre of 7 to 10 (mostly 9) thick, rigid, oblong-lanceolate bracts 4 to 8 mm. long, subacute, entire or very rarely bidenticulate, at length reflexed, blue; involuclers of scarious bractlets, abruptly subulate-acuminate from a broad base, curved, exceeding the flowers; flowers few, blue; calyx-teeth lanceolate, scarious, apiculate, scarcely rigid, as long as the carpels; carpels semiovoid, without the calyx-teeth about 1 mm. long, with very few scales; styles divaricate, exceeding the calyx-teeth; oil-tubes very small, 5, of which 2 are on the commissural side.

Oaxaca: mountains near Tlapancingo, altitude 1800-2400 meters, *Nelson* 2083, December 7, 1894.

Guerrero: summit of Sierra Madre near Chilpancingo, altitude 2700-3060 meters, *Nelson* 2213, December 24, 1894.

Nearest *E. ghiesbreghtii*, but differs in its thicker, oblong, crenate leaves, and more numerous and contiguous involuclral bracts.

Eryngium rosel Hemsl. in Hook. Icon. IV. 6: *pl.* 2579. 1897. Fig. 3.

Perennial, subscapose, glabrous throughout; leaves coriaceous; basal ones distinctly petiolate, strongly unequal, oblong, oblong-ovate, elliptical, or sometimes almost orbicular, without the petiole 1.5 to 5 cm. long, the margin beset with long aculeate bristles; upper leaves few

and only subtending the inflorescence, similar to the basals, but sessile and smaller; scape or flower-bearing stem 15 to 22.5 cm. high, mostly bearing 3 bibracteate peduncles, rarely 1 to 4; heads small, subglobose, without the bracts 6 to 10 mm. in diameter; involucre of 9 to 12 stellately divaricate, thick, rigid, oblong-lanceolate or oblanceolate bracts, 12 to 18 mm. long, mostly entire, sometimes with 1 to 4 teeth, acuminate at apex, white above and at margin; involucels of rigid bractlets, linear-oblong from a broadish base, scarcely acute, a little exceeding the flowers; calyx-teeth ovate, apiculate or scarcely acuminate; carpel (immature) with two forms of scales, those above larger, lanceolate, erect, the others papilliform; styles sub-erect.

Tepic: between Dolores and Santa Gertrudis, *Rose* 2035, August 7, 1897; in the Sierra Madre near Santa Teresa, *Rose* 3456, August 13, 1897.

Zacatecas: east range of the Sierra Madre, *Rose* 3526, August 17, 1897.



FIG. 3. *Eryngium rosei*.

Eryngium spiculosum Hemsl. in Hook. Icon. IV. 6: pl. 2507. 1897.

Plate III c.

Stem erect, apparently 4.5 to 6 dm. high, slender, dichotomously much branched above, glabrous throughout; lower leaves not seen; upper leaves about sessile, glabrous, thin, palmately divided, the largest 11 cm. long, often 3-lobed, sometimes a few small basal lobes in addition, spinose-dentate, the spines not rigid; heads numerous, distinctly slender-peduncled, ovoid or subglobose, 6 to 10 mm. long without the terminal tuft which is of rigid bractlets 2.5 cm. long or less; involucre of 5 to 8 rather rigid, linear-lanceolate bracts, 12 to 24 mm. long, spinose-acuminate, mostly entire, or sometimes with 1 or 2 teeth below the middle; involucels of subulate rigid bractlets exceeding the flowers; flowers distinctly pedicelled; calyx-teeth scarious, ovate, apiculate; carpels scarcely 1.5 mm. long, oblong, almost terete, very densely clothed with minute branching spicules; oil-tubes often 9, rather conspicuous; styles much exceeding the calyx-teeth, divaricate.

Michoacan: *Hahn*.

Morelos: Miacatlan, *Altamirano* 18, December 1875.

Resembling *E. comosum*, but more branching, much less rigid, with palmately divided stem leaves, and carpels covered with minute branching spicules.

***Eryngium sparganophyllum* Hemsl. in Hook. Icon. IV. 6: *pl.* 2508. 1897.**

Fig. 4.

E. longifolium Gray, Pl. Wright. 2: 65. 1853, not Cav.

Stem erect, tall, twice or thrice dichotomous branching above, leafless except a few small bract-like toothed leaves at the ramifications, glabrous throughout; basal leaves

undivided, very narrow, almost linear, acute, 9 to 12 dm. long, soft and spongy, unarmed except a very few very small bristles, strongly involute when dry; heads few, oblong-ovoid, 12 to 24 mm. long, distinctly pedunculate; involucre and involucels of ovate-lanceolate, spinose-acuminate but scarcely rigid bracts; calyx-teeth ovate, apiculate, widely spreading in fruit; carpels oblong, without the calyx-teeth 4 mm. long, longitudinally subtriangular, clothed at the angles with large and spongy scales and between the angles with smaller ones; styles divaricate, exceeding the persistent calyx-teeth; oil-tubes small, solitary in the intervals, 2 on commissural side.

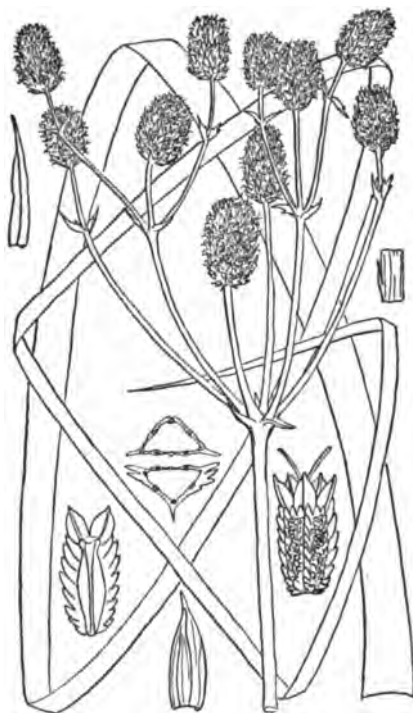


FIG. 4. *Eryngium sparganophyllum*.

New Mexico: Las Playas Springs, near the Sierra de las Animas, *Wright* 1103, in 1851.

Although recorded at present only from New Mexico, this species will very probably be found in Northern Mexico.

The following species from recent collections have been determined by Mr. Hemsley.

***Eryngium beecheyanum* Hook. & Arn. Bot. Beech. Voy. 294. 1840.**

Colima: *Palmer* 62, July 1897.

Jalisco: in the Sierra Madre west of Bolaños, *Rose* 2975, 3739, September 16, 1897.

- Tepic: between Acaponeta and Pedro Pablo, *Rose* 1938, August 2, 1897; near Santa Teresa, *Rose* 2108, 3375, 3401, 3404, August 8, 1897.
Sinaloa: Sierra de Choix, *Goldman* 270, October 19, 1898.
Zacatecas: in the Sierra Madre, *Rose* 2393, August 18, 1897; Valparaiso, *Goldman* 4, 12, November and December, 1897.
Chihuahua: Parral, *Goldman* 122, September 19, 1898.
- Eryngium carlinæ** Delar. Eryng. 53. *pl.* 23. 1808.
Oaxaca: *A. L. Smith* 882.
Chihuahua: between Guadalupe y Calvo and Parral, *Nelson* 4929, September 7, 1898.
- Eryngium columnare** Hemsl. Hook. Ic. IV. 6: *pl.* 2511. 1897.
Durango: near El Salto, *Nelson* 4565, July 12, 1898.
Tepic: near Santa Teresa, *Rose* 2199, August 19, 1897.
Hidalgo: near Pachuca, *Pringle* 6916.
- Eryngium cymosum** Delar. Eryng. 63. *pl.* 31. 1808.
Hidalgo: near Pachuca, *Pringle* 6939.
- Eryngium deppeanum** Cham. & Schlecht. Linnæa 5: 207. 1830.
Oaxaca: *A. L. Smith* 878.
Puebla: Metlatoyuca, *Goldman* 29, 202, January 1898.
- Eryngium involucratum** C. & R. Contr. Nat. Herb. 3: 299. 1895.
Hidalgo: *Pringle* 7624.
- Eryngium longirameum** Turcz. Bull. Soc. Nat. Mosc. 20¹: 171. 1847.
Oaxaca: *A. L. Smith* 880, 881.
Guatemala: mountains near Hacienda of Chancol, *Nelson* 3662, January 2, 1899.
- Eryngium madrense** Watson, Proc. Am. Acad. 23: 274. 1888.
Zacatecas: summit of Sierra Madre, *Rose* 2367, August 17, 1897.
- Eryngium montanum** C. & R. Contr. Nat. Herb. 3: 300. 1895.
Oaxaca: *A. L. Smith* 884.
- Eryngium nasturtifolium** Juss. in Delar. Eryng. 46. *pl.* 17. 1808.
Tepic: Acaponeta, *Rose* 1425, June 22, 1897.
Tamaulipas: Alta Mira, *Goldman* 97, April 20, 1898.
- Eryngium phyteumæ** Delar. Eryng. 51. *pl.* 21. 1808.
Chihuahua: Sierra Madre, near Guachochi, *Goldman* 175, September 27, 1898.
- Eryngium proteæflorum** Delar. Eryng. 62. *pl.* 30. 1808.
State of Mexico: Volcano Toluca, *Nelson* 20, September 9, 1893.

Eryngium scaposum Turcz. Bull. Soc. Nat. Mosc. 20¹: 172. 1847.

Oaxaca: La Parada, *Nelson* 1091, August 19, 1894.

Eryngium seatonii C. & R. Proc. Am. Acad. 28: 118. 1893.

Puebla: west slope of Mt. Orizaba, *Nelson* 271, March 18, 1894.

Eryngium wrightii Gray, Pl. Wright. 1: 78. 1852.

Oaxaca: *Pringle* 6710.

Zacatecas: near Monte Escobedo, *Rose* 3598, August 27, 1897.

8. OSMORHIZA Raf. in Jour. Phys. 89: 257. 1819.

A genus of wide distribution. The single endemic species cited below was referred by Hemsley to *O. brevistylis* DC. of the United States.

Osmorhiza mexicana Griseb. Goett. Abb. 24: 147. 1879.

Chihuahua: Mt. Mohinora, *Nelson* 4864, September 1, 1898.

State of Mexico: *Pringle* 6615, 1896.

Chiapas: above San Cristobal, altitude 2100-2640 meters, *Nelson* 3188, September 18-22, 1895.

Guatemala: mountains near Hacienda of Chancol, altitude 3300 meters, *Nelson* 3645, January 2, 1896.

Costa Rica: altitude 2900 meters, *Pittier* 200, March 30, 1888; altitude 3000 meters, *Pittier* 4273, July 1891.

9. CAUCALIS L. Sp. Pl. 1: 240. 1753.

A genus of wide distribution, represented in Mexico by a single species, *C. microcarpa* Hook. & Arn., which is extensively distributed throughout America and perhaps elsewhere.

10. OREOMYRRHIS Endl. Gen. Plant. 787. 1839.

A genus of wide distribution, represented within our range by the single polymorphic Andean species *O. andicola* Endl. (cited by Hemsley as *O. andina*). The two new species doubtfully referred by Hemsley to this genus he has since transferred to his new genus *Neogoezia*.

11. NEOGOEZIA Hemsley, Kew Bull. 354. 1894.

Mr. Hemsley founded this genus upon two species that he had tentatively described under *Oreomyrrhis*, viz., *N. gracilipes* and *N. planipetala*, and added a new one, *N. minor*. The genus is restricted to Mexico, so far as known, and there are indications of a fourth species not yet described.

Neogoezia planipetala Hemsl. Kew Bull. 1894: 335. 1894.

Tepic: summit of Sierra Madre near Santa Teresa, *Rose* 2107, 3745, August 8-13, 1897.

Durango: in the high mountains, *Rose*, August 16, 1897.

Zacatecas: in the high mountains, *Rose*, August 18, 1897.

These specimens have been referred by Mr. Hemsley to *N. planipetala*, a species collected but once and then not in fruit. The plants collected by Dr. Rose differ strikingly from *N. planipetala* in size and shape of the bracts as described and figured. They represent a species common on both ranges of the Sierra Madre in the states cited above, at an elevation of 1500-2400 meters, and on the slopes and summits of the mountains. The flowering scapes are about 5 dm. high; leaves 10 to 20 cm. long, with somewhat bipinnatifid segments; involucre bracts 12 to 20 mm. long, 3 to 7-toothed or lacinate near the tip (perhaps sometimes entire); pedicels slender, 8 to 12 mm. long; flowers white, with prominent sepals; fruit 4 mm. long.

The type locality of *N. planipetala* is given as 'Bolaños,' in Jalisco. Of course Hartweg did not get it exactly at Bolaños, as this village is in a hot tropical valley, at an altitude of but 840 meters. It may have come from the mountains to the west, although Dr. Rose found no specimens of this genus in these mountains, his specimens coming from mountains one hundred miles to the north.

12. **APIASTRUM** Nuttall in Torr. & Gr. Fl. 1: 643. 1840.

A North American genus of two species, the following being found in Lower California and its neighboring islands.

Apiastrum angustifolium Nutt. l. c.

Cedros Island: *Palmer* 679, in 1889; *Anthony* 310, in 1897.

Lower California: San Quintin, *Palmer* 643, in 1889.

13. **NEONELSONIA** C. & R. Contr. Nat. Herb. 3: 306. 1895.

A genus of two species, the type species being Guatemalan; the other, heretofore referred to *Arracacia*, as seen below, is South American. The genus, therefore, stands as follows:

1. **Neonelsonia acuminata** (Benth.) in Engler & Prantl, Nat. Pflanzfam. 3^e: 167. 1898.

Arracacia acuminata Benth. Pl. Hartw. 187. 1845.

South America: Quitensian Andes near Pichincha, altitude 3600-3780 meters, *J. P. Couthony*, in 1855 (in herb. Gray); New Granada, *Purdie* (in Ball collection).

Proc. Wash. Acad. Sci., December, 1899.

This species agrees with *Neonelsonia* in all essential particulars, and we have no hesitation in referring it to that genus. It differs from *N. ovata* C. & R. in its stronger nerved leaflets of firmer texture, and in the dense ring of short glandular hairs at base of petioles and petiolules, as well as in other details.

The type of this species comes from South America, doubtless not far from the locality of the first specimens referred to above, and the species is restricted to South America. It is stated in the *Kew Index* to be from Mexico, and is likewise included by Mr. Hemsley in the *Biologia Centrali-Americana*. It should be excluded from Mexico as well as from Guatemala; at least the only Mexican specimen referred to by Mr. Hemsley (*Bourgeau* 2837) is a very different species. This specimen is only in flower and its identification was uncertain. Good fruiting specimens, however, were obtained by Mr. Seaton near Bourgeau's locality which permit its characterization, and it is described below as *Arracacia hemsleyana*. The Guatemalan plant referred to by Mr. Hemsley in the *Biologia* proves to be *Neonelsonia ovata* C. & R.

2. *Neonelsonia ovata* C. & R. Contr. Nat. Herb. 3: 307. 1895.

Guatemala: from mountains near Hacienda of Chancol, altitude 3300 meters, *Nelson* 3646, January 2, 1896.

Mr. W. B. Hemsley, in a recent letter, writes that Salvin's plant from Volcan de Fuego, in Guatemala, should be referred to the above rather than to *Arracacia*.

14. *DONNELLSMITHIA* C. & R. Bot. Gaz. 15: 15. *pl.* 2. 1890.

This genus still remains monotypic and restricted to Guatemala, the single species being *D. guatemalensis* C. & R.

15. *MUSINEON* Raf. Jour. Phys. 91: 71. 1820.

A genus of four species, three of which belong to the United States (Rocky Mountains and plains to the eastward from Colorado northward), and the fourth, *M. alpinum* C. & R., is a native of the high mountains of southern Mexico.

16. *MUSENIOPSIS* C. & R. Rev. N. Am. Umbell. 123. 1888.

This genus has proved to be one of the large genera of Mexican Umbelliferae, nineteen species being enumerated below, seventeen of which are endemic. A revision was published by us in 1895, in Contr. Nat. Herb. 3: 301-304. Since that time much new material

has been received, which seems to justify a re-enumeration of the species. Under the species repeated from the former revision only critical remarks and new stations are given.

In his revision of the Umbelliferæ in Engler & Prantl's *Nat. Pflanzenfam.* Drude makes *Museniopsis* a section under *Velæa*. Elsewhere in this paper we show that *Velæa* proper must be included in *Arracacia*, a fact which Drude admits in his supplement. This leaves Drude's sections *Museniopsis* and *Deweya* unprovided for, and in our judgment they should both be restored to generic rank.

SYNOPSIS OF THE SPECIES.

Acaulescent or nearly so; peduncles single, terminal, elongated; involucre of toothed bractlets.

Leaflets ovate, toothed; peduncles 1 to 1.2 dm. long; fruit obtuse.

1. *M. texana*.

Leaflets filiform; peduncles 3 dm. long; fruit acutish.

2. *M. tenuifolia*.

More or less caulescent, much branched; peduncles numerous, short, both terminal and lateral; involucre either wanting or filiform and entire.

Biennials from small globose or spindle-shaped tubers.

Basal leaves with ovate, toothed leaflets; involucre and involucre present..... 3. *M. biennis*.

Basal leaves with linear leaflets.

Pedicels much longer than fruit; lateral umbels often sessile.

Involucre present; leaflets more or less toothed.

4. *M. madreensis*.

Involucre wanting; leaflets more elongated and mostly entire.

5. *M. submontana*.

Pedicels about as long as fruit; lateral umbels not sessile.

Fruit slightly beaked..... 6. *M. tenuissima*.

Fruit obtuse.

Rays less than 2.5 cm. long; fruit not glaucous.

7. *M. tuberosa*.

Rays more than 2.5 cm. long; fruit glaucous.

8. *M. glauca*.

Perennials from long, slender, and sometimes thickened roots.

Basal leaves with linear, elongated, and entire leaflets.

Glaucous; fruit obtuse, with obsolete ribs; lateral umbels often sessile.

Involucral leaf solitary, elongated; fruit smaller and leaflets shorter than in the next..... 9. *M. ternata*.

Involucre wanting; leaflets very long; fruit large for the genus..... 10. *M. schaffneri*.

Glabrous, not glaucous; involucre wanting; no umbels sessile.

Flowers purple..... 11. *M. purpurea*.

Flowers yellow.

Fruit ovate or oblong, longer than broad, with a short beak and rounded base; ribs thick and filiform.

12. *M. peucedanoides*.

Fruit broadly ovate, broader than long, cordate at base, obtuse; ribs filiform. 13. *M. cordata*.

Basal leaves with broader, shorter, more or less toothed leaflets.

Glabrous throughout; involucels present.

Flowers purple..... 14. *M. reticulata*.

Flowers yellow 15. *M. dissecta*.

More or less scabrous or pubescent.

Involucels none.

Leaflets elongated, linear, nearly entire.

16. *M. scabrella*.

Leaflets ovate, serrate.

Leaflets with sharp teeth 17. *M. serrata*.

Leaflets with obtuse teeth 18. *M. ovata*.

Involucels present 19. *M. pubescens*.

1. *Musenopsis texana* (Gray) C. & R. Rev. N. Am. Umbell. 123. 1888.

Tauschia texana Gray, Pl. Lindh. 2: 211. 1850.

Eulophus texanus Benth. & Hook. Gen. Pl. 1: 882 and 885. 1867.

Velva texana Drude, Engler & Prantl, Nat. Pflanzfam. 3^a: 169. 1898.

2. *Musenopsis tenuifolia* (Watson) C. & R. Contr. Nat. Herb. 3: 302. 1895:

Eulophus tenuifolius Watson, Proc. Am. Acad. 23: 276. 1888.

Velva tenuifolia Drude, in Nat. Pflanzfam. 3^a: 169. 1898.

3. *Musenopsis biennis* C. & R., sp. nov.

Biennials from fusiform tubers; stems slender, 4 to 12 dm. high, branching above; basal leaves with petioles 3 to 5 cm. long, twice ternate, with ovate toothed leaflets; upper leaves much reduced, often with linear leaflets; peduncles either wanting or short; pedicels 4 to 5 mm. long; fruit obtuse, 2 mm. long, broader than long and cordate at base.

Michoacan: pine woods, hills of Patzcuaro, *Pringle* 4620, October 25, 1893.

Morelos: mountain woods above Cuernavaca, altitude 2400 meters, *Pringle* 6156, November 5, 1895.

In Contr. Nat. Herb. 3: 302. 1895, this plant was referred to *Smyrniium agopodioides* H.B.K. under the name *Musenopsis agopodioides*.

4. *Musenopsis madrensis* C. & R., sp. nov.

Biennials from a round or somewhat branched tuber; stem slender, erect, somewhat branched, 6 to 8 dm. high; leaves twice to thrice ternate, ultimate divisions usually 3-cleft, linear and entire; umbels of

5 to 8 rays, sessile or on short peduncles (often 6 to 12 cm. long); rays 3 to 5 cm. long; involucre of 1 or 2 pinnate leaves; involucre none; fruit short oblong, 3 mm. long, slightly cordate at base.

Jalisco: on top of mountains west of Bolaños, *Rose* 2966, September 16, 1897.

5. *Museniopsis submontana* C. & R., sp. nov.

From a spindle-shaped tuber, 3 dm. high, with slender, erect, branching stems; leaves once to thrice ternate; ultimate divisions very narrow and elongated, occasionally toothed; umbels of 4 to 6 rays, sessile on peduncles becoming 5 cm. long, with neither involucre nor involucre; rays 2.5 to 3.5 cm. long; pedicels 7 mm. long; fruit immature.

Tepic: in the foothills between Dolores and Santa Gertrudis, *Rose* 2064, August 7, 1897.

6. *Museniopsis tenuissima* C. & R., sp. nov.

Stems 6 to 9 dm. high from oblong tubers, slender and diffusely branching, glabrous throughout; basal leaves on long petioles, 6 times ternate, the divisions widely spreading or even refracted; ultimate divisions filiform, 3.5 cm. or less long; lower stem leaves somewhat similar but smaller; upper leaves much reduced, the petioles to small but conspicuous scarious sheaths, the leaflets few and short; umbels of 3 to 5 rays, on peduncles 4 to 5 cm. long, with neither involucre nor involucre; rays 2.5 to 3.5 cm. long; pedicels 2 mm. long, incurved; flowers bright yellow; fruit glaucous, nearly orbicular, slightly beaked, rounded at base, 3 mm. long.

Jalisco: cool shaded bluffs of mountains near Lake Chapala, *Pringle* 5954, October 18, 1895.

With much the habit of *M. peucedanoides*, but with different fruit and root. The foliage is much like *M. ternata filifolia*, but the fruit is smaller and the pedicels are shorter. Mr. Pringle writes: "The species must be rare, as I found it confined to the shaded bluff of a deep ravine, and searched far and in vain through these mountains for another station."

7. *Museniopsis tuberosa* C. & R. Contr. Nat. Herb. 3: 303. 1895.

Velva tuberosa Drude, in Nat. Pflanzfam. 3⁸: 169. 1898.

Oaxaca: Sierra de San Felipe, altitude 2100-2400 meters, *Charles L. Smith* 897, October 2, 1894.

8. *Museniopsis glauca* C. & R., sp. nov.

Stems about 5 dm. high, erect and much branched above; leaves thrice ternate, ultimate segments filiform; uppermost ones reduced to little more than a scarious sheath; umbels of 5 to 8 rays, loose and spreading, with neither involucre nor involucre; rays 2 to 4 cm. long;

fruiting pedicels few and short; fruit glaucous, nearly orbicular, obtuse, 3 mm. long.

Zacatecas: on the Sierra de los Morones, near Plateado, altitude 2550 meters, *Rose* 2731, September 1, 1897.

9. *Museniopsis ternata* (Watson) C. & R. Contr. Nat. Herb. 3: 303. 1895.

Eulophus ternatus Watson, Proc. Am. Acad. 23: 276. 1888.

Velaa ternata Drude, in Nat. Pflanzfam. 3^a: 169. 1898.

Chihuahua: Mt. Mohinora, *Nelson* 4904, September 1, 1898; Sierra Madre near Guasariachi, altitude 1950-2040 meters, *E. A. Goldman* 158, September 26, 1898.

Durango: near La Providencia, altitude 1950-2400 meters, *Nelson* 4978, 4992, September 11 and 12, 1898.

Tepic: Sierra Madre near Santa Teresa, *Rose* 3439, August 11, 1897. This specimen is only in flower and possibly may belong elsewhere.

- var. *filifolia* C. & R. Contr. Nat. Herb. 3: 303. 1895.

Tepic: top of Sierra Madre between Santa Gertrudis and Santa Teresa, *Rose* 2121, August 8, 1897.

This specimen is only in flower, and therefore its reference is somewhat doubtful. The basal leaves are thrice ternate, with very long ultimate segments, often 12 cm. long.

10. *Museniopsis schaffneri* C. & R. Contr. Nat. Herb. 3: 303. 1895.

Velaa schaffneri Drude, Nat. Pflanzfam. 3^a: 169. 1898.

11. *Museniopsis purpurea* C. & R., sp. nov.

Stem slender, erect and branching, 6 to 9 dm. high, from an elongated root; leaves twice to thrice ternate; ultimate divisions filiform to linear, and usually elongated; umbels with few rays (3 to 6), and neither involucre nor involucrel; rays 1 to 1.5 cm. long; pedicels 4 to 5 mm. long; flowers deep purple; fruit (immature) orbicular, obtuse.

Jalisco: in the Sierra Madre, west of Bolaños, *Rose* 2974, September 15-17, 1897.

Tepic: between Acaponeta and Pedro Paulo, *Rose* 3314, August 2, 1897.

Zacatecas: in the Sierra Madre, *Rose* 2403, August 18, 1897; near Monte Escobedo, *Rose* 2623, August 26, 1897.

Durango: in the Sierra Madre, *Rose* 3472, August 13, 1897.

12. *Museniopsis peucedanoides* (H.B.K.) C. & R. Contr. Nat. Herb. 3: 303. 1895.

Cnidium peucedanoides H.B.K. Nov. Gen. et Sp. 5: 15. 1821.

Eulophus peucedanoides Benth. & Hook. Gen. Pl. 1: 885. 1867.

Velaa peucedanoides Drude, Nat. Pflanzfam. 3^a: 169. 1898.

- Chiapas: along road between Tuxtla and San Cristobal, altitude 690-1650 meters, *Nelson* 3124, September 14, 1895; along road between Tenejapa and Yajalon, altitude 900-1500 meters, *Nelson* 3246, October 13, 1895.
- Oaxaca: Sierra de San Felipe, altitude 2000 meters, *Conzatti & González*, 226, July 25, 1897.
- Vera Cruz: Orizaba, *Altamirano* 25, July 1890.
- Jalisco: near Huejuquilla, *Rose* 2526, August 24, 1897; on table-land near Bolaños, *Rose* 3681, September 9, 1897.
- Tepic: on the Sierra Madre near Santa Teresa, *Rose* 2234, August 13, 1897.
- Sinaloa: near Colomos, *Rose* 1743, July 18, 1897.
13. *Museniopsis cordata* C. & R. Contr. Nat. Herb. 3: 304. 1895.
Velaa cordata Drude, in Nat. Pflanzfam. 3^a: 169. 1898.
14. *Museniopsis reticulata* C. & R., sp. nov.
Stems about 9 dm. high, erect, branching and rather naked above, from an elongated root; leaflets 5, lower pair distant, simple or 2 or 3-cleft, with sharp and distant serrations, linear-lanceolate, 2 to 4 cm. long, 8 to 14 mm. broad, rigid; umbels compact, with very short rays, usually no involucre, and involucels of a few linear bractlets; rays (in flower) 4 to 6 mm. long; pedicels 2 to 3 mm. long; flowers deep purple; fruit immature.
Durango: southern Durango, *Rose* 2257, 3512, August 13-15, 1897.
15. *Museniopsis dissecta* C. & R. Contr. Nat. Herb. 3: 304. 1895.
Velaa dissecta Drude, in Nat. Pflanzfam. 3^a: 169. 1898.
16. *Museniopsis scabrella* C. & R. Contr. Nat. Herb. 3: 304. 1895.
Velaa scabrella Drude, in Nat. Pflanzfam. 3^a: 169. 1898.
17. *Museniopsis serrata* C. & R. Contr. Nat. Herb. 3: 304. 1895.
Velaa serrata Drude, in Nat. Pflanzfam. 3^a: 170. 1898.
Oaxaca: Las Sedas (type locality), *Rose & Hough* 4629, June 16-21, 1899.
18. *Museniopsis ovata* C. & R., sp. nov.
Stems erect and slender, 3 to 6 dm. high, somewhat branching, more or less puberulent; leaves twice ternate, the petioles, veins, and margins more or less scabrous; ultimate divisions ovate, with rounded and apiculate teeth; umbels loose, lateral ones often sessile, with 3 to 6 unequal rays, and neither involucre nor involucel; rays (in flower) 1 to 2.5 cm. long; fruiting pedicels elongated; fruit (immature) puberulent.
Zacatecas: east range of the Sierra Madre, *Rose* 2361, 2394, August 16-18, 1897.

19. *Museniopsis pubescens* C. & R., sp. nov.

Stems tall and much branched, 9 dm. high, pubescent throughout; basal leaves twice ternate; ultimate divisions ovate, irregularly lobed, with callous apiculation; umbel with numerous rays, no involucre, and involucre of a few linear bractlets; rays 2 to 3 cm. long; pedicels 4 to 7 mm. long; flowers white; fruit (immature) pubescent, oblong, 4 mm. long.

Chihuahua: in the Sierra Madre, *Nelson* 6087, June 21, 1899.

This is a peculiar species, and mature fruit may show that it belongs elsewhere.

17. *TAUSCHIA* Schlecht. *Linnæa* 9: 607. 1834.

The genus *Tauschia* was established by Schlechtendal in 1834 upon a single species, *T. nudicaulis*. Two species, *T. coulteri* and *T. texana*, were described by Dr. Gray in 1853 (*Plantæ Lindheimerianæ* 2: 211); and a fourth one indicated but not named by Mr. Hemsley in the *Biologia Centrali-Americana*. *T. coulteri* has recently been transferred to *Arracacia*; *T. texana* has been made the type of a very distinct genus, *Museniopsis*; while the species cited without name is probably not a *Tauschia*. This leaves *Tauschia* with but one of the four species cited by Hemsley.

To the genus *Arracacia*, however, certain anomalous species have been referred from time to time which more properly belong to *Tauschia*, and these are now transferred to it, which with four new species increases the number to eleven, all but the type being endemic, and separating it more clearly from *Arracacia*. The genus *Tauschia*, as outlined above, contains forms of low acaulescent habit, with pinnate leaves, obtuse ribs, and no stylopodium. With this definition it includes the following species, although *T. seatonii* and *T. filiformis* may belong elsewhere.

SYNOPSIS OF THE SPECIES.

OIL-TUBES SOLITARY IN THE INTERVALS.

Acaulescent or weak caulescent.

Flowers yellow; bractlets short.

Involucre with palmately lobed or cleft bractlets.

1. *T. nudicaulis*.

Involucre with bractlets linear and entire.

Short-caulescent, weak plants; flowers yellow.

2. *T. decumbens*.

Acaulescent, with erect scape; flowers white.

3. *T. seatonii*.

Flowers not yellow; bractlets elongated..... 4. *T. filiformis*.

Caulесcent, rather stout and somewhat branching.

Involucel with toothed or lobed bractlets; ribs very prominent.

5. *T. edulis*.

Involucel with entire bractlets; ribs distinct but not prominent.

6. *T. vaginata*.

OIL-TUBES SEVERAL IN THE INTERVALS.

Leaves pinnate.

Involucel with bractlets not broad or toothed.

Leaflets elongated, linear.

More robust and erect; leaflets toothed.

7. *T. mariana*.

Delicate and more or less prostrate; leaflets entire.

8. *T. humilis*.

Leaflets short, ovate.

9. *T. madrensis*.

Involucel with broad and toothed bractlets.

10. *T. nelsoni*.

Leaves entire, linear.

11. *T. linearifolia*.

1. *Tauschia nudicaulis* Schlecht.

Linnaea 9: 608. 1834. Fig. 5.

Usually acaulescent, sometimes bearing a small leaf near the base, nearly glabrous; basal leaves numerous, once pinnate; leaflets 3 to 7 pairs, ovate, serrate or cleft, sometimes 3-parted; peduncles several, much longer than the leaves, sometimes 25 cm. long; rays nearly equal, 8 to 15 mm. long; fruit 21 mm. long.

This species is found on the high mountains of Mexico and has been reported from Ecuador, South America (*Spruce* 6065). Mr. Hemsley reports it from between La Joya and San Salvador (*Galeotti*), and we have seen the specimen collected by *T. Coulter* (no. 1200) and *Rose* (no. 4290, May 20, 1899) from mountains near Jalapa. Excellent material has recently been

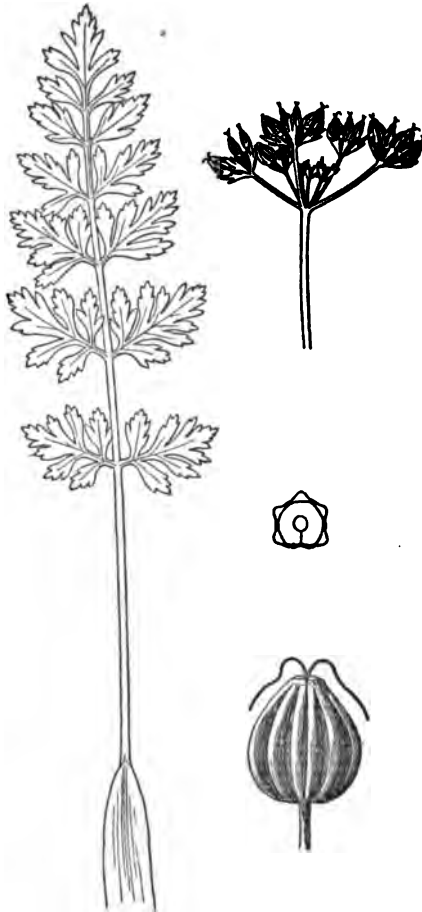


FIG. 5. *Tauschia nudicaulis*.

obtained by *Pringle* from the State of Mexico, August, 1882 (no. 5210), and July, 1894 (no. 4744). Spruce's specimen from South America is similar to the Mexican specimen in habit, but with a somewhat different fruit section and it may yet prove a distinct species.

2. *Tauschia decumbens* (Benth.) C. & R. in Engler & Prantl, Nat. Pflanzfam. 3^e: 170. 1898. Fig. 6.

Velaa decumbens Benth. Pl. Hartw. 38. 1840.

Arracacia decumbens Hemsley, Biol. Centr.-Am. Bot. 1: 564. 1883.

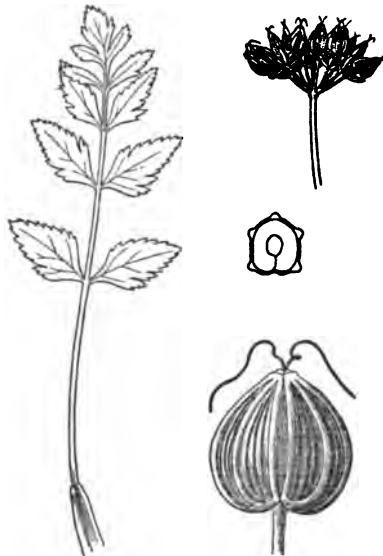


FIG. 6. *Tauschia decumbens*.

Jalisco: Rio Blanco, *Palmer* 51, in 1886; Ferreria, *Jones* 238, in 1892.

3. *Tauschia seatonii* C. & R. Fig. 7.

Arracacia nudicaulis C. & R. Proc. Am. Acad. 28: 119. 1893.

Orizaba: *Seaton* 199, 1891 (type).

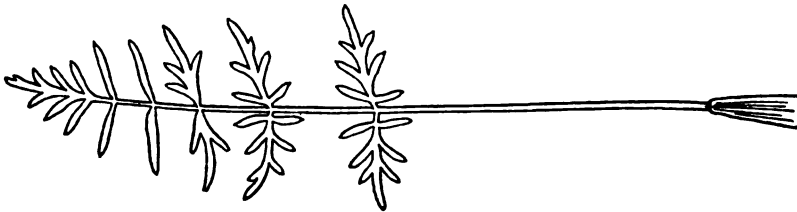


FIG. 7. Basal leaf of *Tauschia seatonii*.

4. *Tauschia filiformis* C. & R. Plate IV *b*.

Arracacia filiformis C. & R. Hooker's Icones, t. 2429. 1896.

Oaxaca: Sierra de San Felipe, *Pringle* 4714, in 1894 (type); same station, *Nelson* 1088, in 1894; Mt. Zempoaltepec, *Nelson* 621, in 1894.

5. *Tauschia edulis* (Watson) C. & R. in Engler & Prantl, Nat. Pflanzfam. 3^e: 170. 1898. Plate IV *c*.

Arracacia edulis Watson, Proc. Am. Acad. 21: 430. 1886.

Chihuahua: *Palmer*, in 1885; *Nelson* 4799, 4836, 4893, in 1898; *Goldman* 181, in 1898.

6. *Tauschia vaginata* C. & R. Fig. 8.

Arracacia (?) *vaginata* C. & R. Contr. Nat. Herb. 3: 296. 1891.

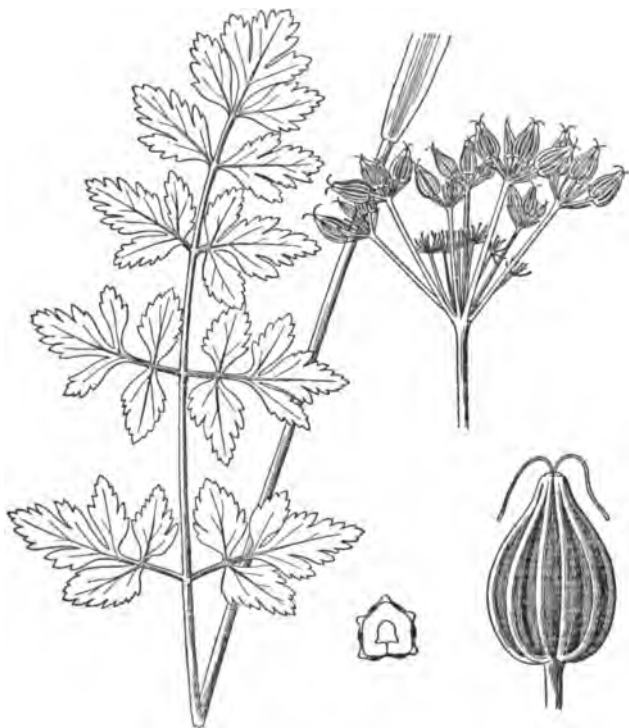


FIG. 8. *Tauschia vaginata*.

Oaxaca: "borders of woodlands, Sierra de Clavellinas," *Pringle* 6008, in 1894 (type).

7. *Tauschia mariana* (Watson) C. & R. in Engler & Prantl, Nat. Pflanzfam. 3^e: 170. 1898. Plate IV *a*.

Arracacia mariana Watson, Proc. Am. Acad. 26: 136. 1891.

State of Mexico: Valley of Toluca, *Pringle* 4198, in 1892.

8. *Tauschia humilis* C. & R., sp. nov.

Weak caulescent, from tuberous thickened roots, glabrous except in the inflorescence; leaves and peduncles more or less decumbent, 1 to 2 dm. long; lower leaves 5-7 cm. long, twice to thrice pinnate, the ultimate segments linear and entire; involucre none or of a single elongated bract; involucrel of several linear, distinct, entire bractlets; rays 5 or 6, about 2.5 cm. long; fruiting pedicels very short, 1-2 mm. long, sterile pedicels longer; flowers yellow; fruit glabrous, ovate, 2 mm. long; oil-tubes several in the intervals.

Hidalgo: Sierra de Pachuca, altitude 2940 meters, *Pringle* 6954, August 4, 1898; same station, *Pringle* 7896, October 6, 1899.

9. *Tauschia madrensis* C. & R., sp. nov.

Plate V.

Acaulescent from thick elongated roots; leaves 5 to 10, 5 to 12 cm. long, bipinnate; ultimate segments small, somewhat ovate in outline, 3 to 5-toothed or cut, glabrous except the rachis and some of the larger veins; scape 1 to 3 dm. long, erect or nearly so, longer than the leaves; inflorescence slightly puberulent; involucre none; involucrel of several oblong-linear, distinct, entire bractlets longer than the pedicels; fruiting rays 3 or 4, nearly equal, 10 mm. or less long; pedicels very short, 2 to 3 mm. long; fruit glabrous, strongly flattened laterally, broadly ovate, rounded at base, 4 mm. long; oil-tubes several in the broad intervals.

Tepic: swampy meadows on top of the west range of the Sierra Madre near Santa Gertrudis, *Rose* 2103, August 8, 1897.

10. *Tauschia nelsoni* C. & R., sp. nov.

Short caulescent, 2-3 dm. high, glabrous; lower leaves 10-15 cm. long, twice to thrice pinnate, the linear and entire segments crowded; involucre none or of a single short scarious bract; involucrel of several short, ovate to orbicular, mostly toothed bractlets; rays 8 to 12, 10-15 mm. long; pedicels very short, about 1 mm. long; flowers yellow; fruit glabrous, ovate, 4 mm. long; oil-tubes several in the intervals.

Durango: near El Salto, *Nelson* 4561, July 12, 1898.

11. *Tauschia linearifolia* C. & R., sp. nov.

Plate VI.

Acaulescent or nearly so, from thick elongated roots; leaves 6 to 13, erect, 8 to 20 cm. long, linear, slightly tapering at base into slender petioles, acute, margin entire and slightly revolute, glabrous, pale, parallel-veined; peduncle or scape shorter or longer than the leaves; involucre wanting or of a single bract, and involucrel of several bractlets, both orbicular and acuminate, strongly nerved and purplish, 3 mm. in diameter; rays 6 to 10, nearly equal, short (5 to 6 mm.) long; fruiting pedicels 1 mm. long, sterile ones longer; fruit strongly flattened laterally, broadly ovate, cordate at base, slightly tapering at apex, 6 mm. long, 4 mm. broad; oil-tubes several in the broad intervals.

Tepic: in a swamp on top of the west range of the Sierra Madre near the little Indian hamlet of Santa Gertrudis, *Rose* 2104, August 8, 1897.

18. *ARRACACIA* Bancr. in Jamaic. Jour. 4: 18. 1826.

A Mexican and Central American genus extending into South America, with one species (the type) in Jamaica. Hemsley enumerated twelve species, only five of which bear names. Of these *A. acuminata* Benth. is referred below to *Neonelsonia*; *A. decumbens* Benth. is referred below to *Tauschia*; while *A. glaucescens* Benth. is restricted to South America. This leaves but two of the named species cited by Hemsley: *A. atropurpurea* Benth. & Hook. and *A. toluensis* Hemsley. Two species, cited by Hemsley under other genera, we have transferred to *Arracacia*, viz., *Tauschia coulteri* Gray and *Smyrnum ægopodioides* H.B.K.

Since 1880 fourteen new species of *Arracacia* from our region have been described, five of which have been transferred to *Tauschia*. In addition to these we describe below seven new species, making the total enumeration of the species of *Arracacia* found in Mexico and Central America reach twenty, all of which are endemic. Of the four remaining species of the genus, three belong to South America and one to Jamaica.

The genus *Arracacia* appears to be properly characterized as containing forms which are tall and branching, with ternate leaves, sharply ribbed fruit, and conical stylopodium. The allied genus *Tauschia*, on the other hand, contains forms which are low and acaulescent or nearly so, with pinnate leaves, obtuse ribs, and no stylopodium.

We present an enumeration of all the known species of *Arracacia*, with descriptions of new species and citations of collections received since the publication of our former paper.

1. *Arracacia andina* Britton, Bull. Torr. Bot. Club 18: 37. 1891.

This species, collected by *Dr. Rusby* in South America, seems not to be an *Arracacia*.

2. *Arracacia ægopodioides* (H.B.K.) C. & R. Plate XI.

Smyrnum ægopodioides H.B.K. Nov. Gen. & Spec. 5: 16. 1821.

Musenopsis ægopodioides C. & R. Contr. Nat. Herb. 3: 302. 1895, as to reference, but not as to plant.

Hidalgo: on the Sierra de Pachuca, altitude 2700 meters, *Pringle* 6934, July 28, 1898; same station, *Rose & Hough* 4431, June 1, 1899; same station, *Pringle* 7905, October 5, 1899.

The type of this species was collected by Humboldt & Bonpland (altitude 2550 meters) and is now in the Berlin Herbarium. Through the kindness of Dr. K. Schumann we have seen a fragment of the type and also a photograph of it, which is here reproduced. Mr. Pringle's plant seems to agree with it and the species is herewith trans-

ferred to the genus *Arracacia*. The species at first suggests *A. atropurpurea*, but the two are to be kept separate, as the following differences appear to be constant. *A. agopodioides* is low and herbaceous, arising from a deep-seated, long, spindle-shaped tuber, while *A. atropurpurea* is half shrubby; the former has yellow flowers, the latter purple; in the former the bractlets of the involucre are linear and filiform, insignificant and entire, and not conspicuous and serrate; while the leaflets are more obtuse, with more regular and blunter teeth, etc.

3. *Arracacia atropurpurea* (Lehm.) Hemsl. Biol. Centr.-Am. Bot. 1: 564. 1880.

Pentacryphia atropurpurea Lehm. Linnæa 5: 380. pl. 5. fig. 2. 1830.

State of Mexico: Amecameca, *Altamirano* 11, 12, May 11, 1890.

Federal District: between San Angel and Fetelpa, *Altamirano* 4, July 13, 1890; Apasco, *Altamirano* 16, November 1890; El Desierto Viejo, *Altamirano* 27, July 1890.

4. *Arracacia bracteata* C. & R. Contr. Nat. Herb. 3: 295. 1895.

Chiapas: above San Cristobal, altitude 2100-2640 meters, *Nelson* 3175, September 18-22, 1895; *Ghiesbreght* 63, in 1864-70 (in Herb. Gray). Type (no. 453) in Nat. Herb.

5. *Arracacia brandegei* C. & R. Proc. Cal. Acad. 2: 2: 165. 1889.
Type (no. 507) in Nat. Herb.

6. *Arracacia brevipes* C. & R. Contr. Nat. Herb. 3: 296. 1895.

Stems woody, 3 to 15 dm. high.

Oaxaca: in the Sierra de San Felipe, altitude 2850 meters, *Pringle* 6266, December 10, 1895. Type (no. 452) in Nat. Herb.

7. *Arracacia chiapensis* C. & R., sp. nov. Plate VII.

Herb 12 to 24 dm. high, glabrous throughout, more or less branched above; radical leaves not seen; upper stem leaves twice ternate, on short inflated petioles; leaflets lanceolate, acuminate, with a broad cuneate or sometimes truncate base, sharply serrate, 2.5 to 7.5 cm. long, glabrous; peduncles axillary or terminal, 15 cm. or less long; rays of umbel elongated, fruiting ones nearly equal, 6 to 7.5 cm. long; involucre of 3 or 4 linear bracts; involucre of 4 to 8 linear bractlets, generally longer than the pedicels but not extending beyond the fruit; pedicels with fruit usually 3 to 5, rather stout, 5 to 7.5 cm. long; fruit ovate, 8 to 9 mm. long, rounded at base, glabrous; stylopodium long conical; cross-section of carpel nearly terete; seed-face strongly involute, inclosing a central cavity; oil-tubes solitary in the intervals, 2 or 3 on the commissural side; flowers greenish white, the buds often purplish.

Chiapas: near Pinabete, altitude 2100-2400 meters, *Nelson* 3776, February 8, 1896.

8. *Arracacia coulteri* Rose, Contr. Nat. Herb. 3: 296. 1895.

Tauschia coulteri Gray, Plant. Lindh. 2: 211. 1853.

Hidalgo: near Real del Monte (type locality), *Rose* 4485, June 2, 1899.

Type in Herb. Gray, drawing in Nat. Herb.

9. *Arracacia dissecta* C. & R., sp. nov.

In dense clumps, 9 to 12 dm. high, scabrous on leaf margins and veins beneath, otherwise glabrous; leaves very large, ternately decomposed; segments linear to linear-oblong, 2 to 4 cm. long, entire or occasionally somewhat toothed or cleft, terminating in a conspicuous callous apex; uppermost leaves alternate or opposite, much reduced, sometimes nearly simple; peduncles axillary or terminal, 5 to 8 cm. long; rays about 12, unequal, 2 to 8 cm. long; involucre and involucels wanting, or occasionally represented by a bract; fruiting pedicels 3 to 4 mm. long; fruit (immature) oblong, 4 mm. long, glabrous.

Pueblo: Acatlan, *Rose & Hough* 4709, June 27, 1899.

10. *Arracacia donnellsmithii* C. & R. Bot. Gaz. 15: 261. pl. 15. 1890.

Guatemala: Todos Santos, altitude 3000 meters, *Nelson* 3630, December 26, 1895. Type in Nat. Herb.

11. *Arracacia dugesii* C. & R., sp. nov.

Plate VIII.

Tall coarse herbs, probably 1.2 to 2.5 dm. high, in habit and foliage suggesting the genus *Prionosciadium*; leaves several times ternate; ultimate segments linear, 5 cm. or less long, acute, entire or with a few irregular sharp teeth; involucre wanting; involucel of several setaceous bractlets; rays numerous, mostly fruiting, in some umbels often less than 2.5 cm. long and equal, in others more unequal, sometimes 7.5 cm. long; pedicels 3 to 6 mm. long; fruit ovate, 6 mm. long; ribs sharp; oil-tubes 2 or 3 in the intervals, 4 on the commissural side.

Guanajuato: near City of Guanajuato, *Duges* 317, in 1893; same station, *Duges*, in 1895; same station, *Rose & Hough* 4847, July 11, 1899.

12. *Arracacia glaucescens* Benth. Pl. Hartw. 187. 1845.

The type comes from South America, but it has been reported from Mexico.

13. *Arracacia hemsleyana* C. & R., sp. nov.

Plate IX.

Stems slender, glabrous; leaves thrice ternate; leaflets lanceolate, long acuminate, 5 cm. or less long, cuneate or truncate at base, sharply serrate, glabrous; inflorescence more or less branching; terminal umbel sessile or short peduncled; rays 6 to 9, slightly unequal, 1.8 to 3 cm. long, somewhat spreading; umbellets several-flowered but only 3 or 4 fruiting; involucre and involucels none, or the latter of a few small bractlets; pedicels 4 to 6 mm. long; fruit 6 to 8 mm. long, oblong; stylopodium conical; flowers purple.

San Luis Potosi: on limestone ledges, Las Canoas and Tamasopo Canyon, *Pringle* 5016, June 13-August 21, 1891.

Orizaba : *Bourgeau* 2837, in 1865-66 ; *Seaton* 97 (type), July 30, 1891 ; also according to Mr. Hemsley in litt. from Orizaba (*Botteri* 869).

Chiapas : from pine forests of Pueblo Nueva, *Linden* 586. From its range it should be *A. chiapensis*.

This is *Arracacia acuminata* Hemsley Biol. Cent.-Am. 1 : 564 as to Mexican plant, not of Benthams, which is a *Neonelsonia*.

14. *Arracacia luxurans* C. & R., Bot. Gaz. 18 : 55. 1893.

Type in Nat. Herb.

15. *Arracacia longipedunculata* C. & R., sp. nov. Plate X.

Stems 6 to 9 dm. high, somewhat branching, glabrous ; radical and lower stem leaves long petioled (20 cm. long), 2 to 3 times ternate ; leaflets ovate, acute, coarsely toothed and apiculate, 5 to 6.2 cm. long, the central one cuneate at base, the lateral ones mostly rounded ; upper stem leaves much smaller, opposite, once ternate and leaflets linear ; inflorescence a single terminal umbel ; peduncle 5 to 7.5 cm. long ; involucre none ; involucre of 1 to 3 filiform bractlets ; rays spreading, 5 cm. or less long, somewhat unequal ; pedicels 4 to 6 mm. long ; fruit oblong, 5 mm. long, rounded at base, slightly beaked at apex ; stylopodium low conical ; ribs filiform ; oil-tubes 3 in the intervals.

Morelos : in canyons above Cuernavaca, *Pringle* 6333, June 19, 1896.

16. *Arracacia montana* C. & R., sp. nov.

Stems 6 to 10 dm. high, glabrous throughout ; leaves large, 3 to 4 times ternate ; ultimate segments somewhat lanceolate, paler beneath and slightly scabrous, serrate and apiculate ; inflorescence large and naked, with verticillate branches ; involucre and involucels wanting ; rays nearly equal, numerous, 20 to 25 mm. long ; pedicels 2 to 3 mm. long ; fruit 6 mm. long ; oil-tubes usually solitary in the intervals.

Zacatecas : between Colotlan and Plateado, *Rose* 2807, September 4, 1897 ; Sierra de los Morones, *Rose* 3620, September 1, 1897.

Jalisco : near Escabado, *Rose* 2624, August 26, 1897 ; on the road between Mesquitez and Monte Escabado, *Rose* 3584, August 1897.

The specimens show considerable variation but apparently all belong to the same species.

17. *Arracacia moschata* (H.B.K.) DC. Prod. 4 : 244. 1830.

Conium moschatum H.B.K. Nov. Gen. et Spec. 5 : 14. pl. 420. 1821.

This species is a native of South America, and is the only one of the genus not in our collection.

18. *Arracacia multifida* Wats. Proc. Am. Acad. 26 : 136. 1891.

Only known from collections of Mr. Pringle. Type in Herb. Gray.

19. *Arracacia nelsoni* C. & R. Contr. Nat. Herb. 3: 296. 1895.

Oaxaca: oak forests, Sierra de San Felipe, altitude 2850 meters, *Pringle* 5955, December 10, 1895. Type (no. 451) in Nat. Herb.

20. *Arracacia ovata* C. & R. Contr. Nat. Herb. 3: 296. 1895.

Type (no. 448) in Nat. Herb.

21. *Arracacia pringlei* C. & R. Contr. Nat. Herb. 3: 297. 1895.

Type (no. 450) in Nat. Herb.

22. *Arracacia rigida* C. & R., sp. nov.

Stems several from a common root, 1-2 meters high, branching above, glabrous; lower leaves few, on petioles 30-60 cm. long; leaves large, 3 or 4 times ternate; upper ones once to twice ternate, petiolate or sessile, ovate, rounded at base, acute, regularly and sharply serrate, glabrous on both sides; umbels few, usually terminal; involucre wanting or a single ovate bract with a long acumination; involucre of several filiform bractlets; rays and pedicels puberulent; fruiting peduncle stiff and stout, 12 cm. long (in our specimen); rays stiff, subequal, 2 to 4 cm. long; pedicels 4 mm. long, shorter than fruit; fruit oblong-ovate, 8 mm. long, rounded at base, glabrous; carpel nearly terete in section; ribs very obtuse; oil-tubes solitary in the intervals; flowers purplish.

Hidalgo: by a tumbling brook in a rocky gorge of the Sierra de Pachuca, altitude 2850 meters, *Pringle* 6953, August 3, 1898.

The whole plant has a strong odor of musk. This species has much the habit and foliage of *A. ovata*, but with sharper toothed leaves.

23. *Arracacia tolucensis* (H.B.K.) Hemsl. Biol. Centr.-Am. Bot. 1: 564. 1880. Plates XII, XIII.

Ligusticum tolucensis H.B.K. Nov. Gen. et Spec. : 19. pl. 422. 1821.

Velæa tolucensis DC. Prod. 4: 231. 1830.

Cnidium tolucense Spreng. Syst. 1: 888. 1825.

This species has long been a puzzle both as to genus and species. No material could be found in the recent rich collections from Mexico, while the illustration and description are silent as to the essential generic characters of the group. At the request of Dr. Rose, Mr. Pringle visited the type locality, but found it planted in corn and no specimens could be obtained. Through the kindness of Dr. Karl Schumann photographs of the type of *Velæa tolucensis* were obtained (reproduced herewith), which show that Mr. Hemsley has properly referred the species to *Arracacia*. As this species is also the type of *Velæa* that genus must be merged under *Arracacia*.

Proc. Wash. Acad. Sci., December, 1899.

24. *Arracacia xanthorrhiza* Bancr. Jamaic. Journ. 4: 18. 1826.

This is the type of the genus and was based upon specimens collected in Jamaica. We have recently received specimens from the Botanical Department of Jamaica.

The following species are to be excluded:

- Arracacia acuminata* Benth. = *Neonelsonia* sp.
- “ *decumbens* B. & H. = *Tauschia* sp.
- “ *mariana* Watson = *Tauschia* sp.
- “ *edulis* Watson = *Tauschia* sp.
- “ *vaginata* C. & R. = *Tauschia* sp.
- “ *filifolia* C. & R. = *Tauschia* sp.
- “ *nudicaulis* C. & R. = *Tauschia* sp.
- “ *arguta* B. & H. = *Deweya* sp.
- “ *hartwegi* Watson = *Deweya* sp.
- “ *kelloggii* Watson = *Deweya* sp.
- “ *parishii* Greene = *Deweya* sp.
- “ *vestita* Watson = *Deweya* sp.

19. OTTOA H.B.K. Nov. Gen. et Sp. 5: 20. 1821.

A South American genus, of a single species, which extends into South Mexico.

Ottoa oenanthoides H.B.K. Nov. Gen. et Sp. 5: 20. *pl.* 423. 1821.

Vera Cruz: C. de Perote, *Nelson* 2030, May 1893.

Oaxaca: Sierra de San Felipe, altitude 3000 meters, *Charles L. Smith* 894, September 25, 1894.

20. APIUM L. Sp. Pl. 1: 264. 1753.

A genus of world-wide distribution. For the Mexican and Central American region Hemsley enumerated five species, four of which bear names. Of these, *A. echinatum* Benth. & Hook. has been transferred to *Leptocaulis*; *A. graveolens* L. is an introduced species; *A. popei* Gray has been transferred to *Ammoselinum*; while *A. leptophyllum* Mull. becomes *A. ammi*, as indicated below. This leaves a single native, but not endemic species for our region.

Apium ammi (Jacq.) Urban, Fl. Bras. 11¹: 341. *pl.* 91. 1879.

Sison ammi Jacq. Hort. Vindob. 2: *pl.* 200. 1772.

Apium leptophyllum F. Muel in Benth. Fl. Austral. 3: 372. 1866.

Lower California: in the Plaza, La Paz, *Rose* 1322, June 14, 1897.

State of Mexico: Chimalcapan, *Altamirano* 8, June 1890.

Federal District: *Altamirano* 5, July 1890.

Vera Cruz: Papantla, *E. A. Goldman* 80, March 7, 1898.

Durango: near City of Durango, *Palmer* 258, April–November 1896.

Chiapas: about Tumbala, altitude 1200-1650 meters, *Nelson* 3341, October 20-29, 1895; Valley of Comitán, altitude 1740-1950 meters, *Nelson* 3483, December 8-10, 1895.

Guatemala: on mountains near Hacienda of Chancol, altitude 3300 meters, *Nelson* 2666, January 2, 1896.

Costa Rica: *Pittier & Tonduz* 1287, August 1889, and 4357, August 1891; altitude 1355 meters, *Tonduz* 7689, March 1893.

21. *LEPTOCAULIS* Nutt. in DC. Coll. Mem. 5: 39. *pl.* 10. 1829.

A genus of the United States, represented in Northern Mexico by a single species, *L. echinatus* Nutt., which is not endemic. This has not been collected in Mexico for many years, and no Mexican specimens are found in the National Herbarium.

22. *AMMOSELINUM* Torr. & Gray, Pac. R. Rep. 2: 165. 1855.

A genus of southwestern United States, including but two species, one of which, *A. popei* Gray, has been collected once by *Palmer* near Monterey, Nuevo Leon.

23. *CICUTA* L. Sp. Pl. 1: 255. 1753.

A genus widely distributed throughout the northern hemisphere. The single endemic species described below Hemsley referred to the common *C. maculata* of the United States. In 1887, Watson described a second Mexican species of *Cicuta* (*C. linearifolia*), which proved to be a *Prionosciadium*.

Cicuta mexicana C. & R., sp. nov.

Apparently robust, 9 to 12 dm. high; basal leaves twice ternate and then bipinnate: leaflets lanceolate, 3 to 7 cm. long, serrate, the veinlets running to the sinuses; umbel with numerous unequal rays, with involucre mostly wanting, and involucre of numerous, rather conspicuous, elongated linear bractlets; rays (in flower) 4 to 8 cm. long, pedicels very unequal, 2 cm. or less long; fruit very immature.

Vera Cruz: Coatzacoalcas, Isthmus of Tehuantepec, *Charles L. Smith* 1161, April 1, 1895; swamps near Jalapa, altitude 1200 meters, *Pringle* 7708, in 1899.

This is undoubtedly the *Cicuta* referred by Hemsley in *Biol. Centr.-Amer.* to *C. maculata*, a species whose range seems to be entirely north of Mexico.

24. *PIMPINELLA* L. Sp. Pl. 1: 263. 1753.

A large genus of world-wide distribution, represented in Mexico by the single peculiar species *P. mexicana* Robinson, Proc. Am. Acad. 26: 164. 1891.

25. *BERULA* Hoff. in Bess. Enum. Pl. Volh. 44. 1822.

A genus of one or two species, which are said to be of nearly world-wide distribution. Our single species, *B. erecta*, was cited by Hemsley as *Sium angustifolium* L.

Berula erecta (Huds.) Coville, Contr. Nat. Herb. 4: 115. 1893.

Berula angustifolia Mert. & Koch, in Roehl. Deutschl. Fl. 2: 433. 1826.

Sium erectum Huds. Fl. Angl. 103. 1862.

State of Mexico: Lago de Chalco, *Altamirano* 17, June 1891.

Chiapas: above San Cristobal, altitude 2100-2640 meters, *Nelson* 3132, September 18-22, 1895.

26. *CENANTHE* L. Sp. Pl. 1: 254. 1753.

A genus of wide distribution with a single Mexican species. Hemsley reported it in the Mexican flora to include a single unnamed species which later he discovered to be an *Arracacia*. It is restored to the Mexican flora, however, by the discovery of *C. pringlei* C. & R.

27. *LILÆOPSIS* Greene, Pittonia 2: 192. 1891.

A genus represented in the United States by four species, one of which extends into Mexico and South America. This species, *L. schaffneriana* C. & R. (*Crantzia schaffneriana* Schlecht.), Hemsley referred to the common United States species of the Atlantic seaboard, *L. lineata* Greene (*Crantzia lineata* Nutt.). The genus is also represented in Brazil and Australia.

Lilæopsis schaffneriana (Schlecht.) C. & R. Bot. Gaz. 24: 48. 1897.

Crantzia schaffneriana Schlecht. Linnæa 26: 370. 1853.

Federal District: near Chapultapec. (type locality), *Rose & Hough* 4545, June 11, 1899.

Jalisco: Orendain, *Rose & Hough* 4799, July 5-6, 1899.

28. *LIGUSTICUM* L. Sp. Pl. 1: 250. 1753.

A genus widely distributed throughout the northern hemisphere, and represented in Mexico by two species. The only species included by Hemsley, *L. dubium* H.B.K., is to be excluded, as it is not a *Ligusticum*, although on account of the disappearance of the type it is difficult to determine its exact place. Specimens collected by *Rose* (no. 4450, June 1, 1899) near the type locality, and satisfying the description, belong clearly to *Prionosciadium*. The genus is represented in Mexico, therefore, only by the two new species described below.

Ligusticum goldmani C. & R., sp. nov.

Resembling *L. nelsoni* C. & R., but differing in its less sharply cut

foliage, narrowly oblong fruit which is 8 mm. long and with a more evident minutely reticulate surface, sharper ribs, and more conical stylopodium.

Chihuahua: Sierra Madre, 65 miles east of Batopilas, altitude 2100 meters, *Goldman* 180, October 1 and 2, 1898; near Batopilas, altitude 1650-1950 meters, *Goldman* 209, October 4 and 5, 1898.

***Ligusticum nelsoni* C. & R., sp. nov.**

Rather stout, 6-12 dm. high, glabrous throughout; leaves large, biternate then pinnate; the segments laciniately lobed, the lobes sharply cut or entire; umbel of numerous rays, with no involucler and mostly no involucre; fruiting rays about 5 cm. long; pedicels unequal, 6 to 10 mm. long; flowers white; fruit oblong, 4 mm. long, stylopodium low conical.

Chihuahua: Sierra Madre, S. W. Chihuahua, *Nelson* 4809, August 20, 1898; Mt. Mohinora, *Nelson* 4873, September 1, 1898.

Nearest *L. porteri* C. & R., but it differs from the type specimens of that species chiefly in its much more sharply cut leaves, as well as in its distinct range.

29. COAXANA C. & R. Contr. Nat. Herb. 3: 297. 1895.

A monotypic mountain genus, collected by *Nelson* near the summit of Mt. Zempoaltepec, in the state of Oaxaca, at an altitude of 3000 to 3300 meters. The single species is *C. purpurea* C. & R.

30. CONIOSELINUM Fisch. in Hoff. Gen. Umb. 180. 1814.

A genus of about seven species, chiefly found in Western Asia and the United States. The following new species is the only Mexican representative.

***Conioselinum mexicanum* C. & R., sp. nov.**

Slender, 6 to 9 dm. high, somewhat leafy, glabrous except the puberulent inflorescence; leaves bipinnate; ultimate segments ovate, lobed or entire; umbel of 7 to 10 nearly equal rays, with no involucre, and involucler wanting or of filiform bractlets; rays in fruit 2.5 cm. long, pedicels 6 mm. long; flowers white; fruit nearly orbicular, 3 mm. long, with prominent lateral wings.

Chihuahua: Sierra Madre, 65 miles east of Batopilas, altitude 2100 meters, *Goldman* 191, October 1 and 2, 1898.

31. ANGELICA L. Sp. Pl. 1: 250. 1753.

A genus chiefly distributed in the cooler regions of the northern hemisphere, and represented in Mexico by four species. Hemsley enumerates four species, but one of them bearing a name (*A. mexicana* Vatke) and proving to be a *Prionosciadium*. His three un-

named species are *A. seatonii* C. & R., *A. nelsonii* C. & R., and probably *A. polycarpa* C. & R. The fourth *Angelica* of the flora is *A. pringlei* C. & R.

Angelica polycarpa C. & R., sp. nov.

Nearest *A. pringlei* C. & R., but a stouter plant; leaves much coarser, somewhat pubescent, 6 dm. long including the very long petiole, twice or thrice ternate; leaflets 5 to 7.5 cm. long; rays more numerous (about 40), very unequal, 5 to 7 cm. long; fruit larger, 4 to 5 mm. long, with lateral wings thinner and broader (2 mm.), the dorsal and intermediates more prominent especially at base.

Federal district: on streams at Tlalpam, near City of Mexico, altitude 2190 meters, *Pringle* 6467, September 5, 1896.

Angelica pringlei C. & R. Contr. Nat. Herb. 3: 295. 1895.

State of Mexico: by streams, Sierra de las Cruces, altitude 3300 meters, *Pringle* 6147, October 5, 1895.

32. PRIONOSCIADIUM Watson, Proc. Am. Acad. 23: 275. 1888.

This endemic genus was established by Watson in 1888, and included three species, *P. madreense*, *P. mexicana*, and *P. pringlei*. Recent collections have remarkably increased it, no less than twelve additional species being described, and with indications of still others. The genus is justified not only by these additional species, but also by the fact that the earlier known forms were variously referred to such dissimilar genera as *Angelica*, *Peucedanum*, and *Cicuta*.

As at present understood it contains the following species.

SYNOPSIS OF SPECIFIC GROUPS.

Main rachis of leaves and its primary branches bearing conspicuous, more or less serrate wings.

Leaf-segments obtuse or acute (not acuminate), somewhat regularly serrate or crenate, thickish.

1. *P. cuneatum*; 2. *P. serratum*.

Leaf-segments acuminate, irregularly incised, serrate, thin.

3. *P. acuminatum*; 4. *P. nelsonii*.

Rachis mostly without wings.

Leaf-segments rather large, oblong to ovate, mostly serrate or crenate, more or less confluent.

5. *P. megacarpum*; 6. *P. mexicanum*; 7. *P. pringlei*.

Leaf-segments small, lanceolate to ovate in outline, pinnatifid toothed or lobed segments.

8. *P. madreense*; 9. *P. macrophyllum*;

10. *P. dissectum*; 11. *P. durangense*.

Leaf-segments elongated, narrowly linear to lance-linear, serrate to pinnately lobed.

12. *P. watsonii*; 13. *P. linearifolium*;

14. *P. filifolium*; 15. *P. tenuifolium*.

1. *Prionosciadium cuneatum* C. & R., sp. nov.

Plant 18 to 24 dm. high, with glaucous stem; leaf-segments scabrous above and pubescent on the veins beneath, oblong in outline, irregularly pinnatifid-lobed or crenate-lobed, usually acute, each pair of segments joined to the one below by the broad wings of the rachis, which form a series of conspicuous wedges connecting the segments; inflorescence widely spreading, with verticillate primary branches and long peduncles (7.5 to 10 cm. long); fruit oblong, about 10 mm. long, wings not as broad as body.

Jalisco: on grassy slope of barranca near Guadalajara, *Pringle* 3868, September 12, 1891 (distributed as *P. pringlei*); between Bolaños and Guadalajara, *Rose* 3047, September 21, 1897; on barranca near Guadalajara, *Rose & Hough* 4822, July 9, 1899.

2. *Prionosciadium serratum* C. & R., sp. nov.

Plant 6 to 15 dm. high, with pubescent stem; leaf-segments somewhat scabrous above and slightly pubescent beneath, oblong to ovate in outline, more or less lobed, sharply serrate and mostly obtuse; the wings of the rachis very conspicuous and serrate, somewhat narrowed below; inflorescence often compact, of a few short verticillate peduncles; rays 10 to 20 mm. long; pedicels 2 mm. long; fruit broadly oblong, 8 to 10 mm. long, wings broader than body.

Durango: in the mountains of Southern Durango, *Rose* 2343, August 16, 1897; on the table-land between Colotlan and Bolaños, *Rose* 2836, September 8, 1897.

Jalisco: on the slopes of the barranca near Guadalajara, *Pringle* 3886, September 18, 1891 (distributed as *P. mexicanum*).

3. *Prionosciadium acuminatum* Robinson in litt., sp. nov.

Stems 12 to 18 dm. high, glabrous or nearly so; leaves large, twice ternate; leaflets ovate, acuminate, more or less lobed and cleft, irregularly and sharply serrate; peduncles short and slender; rays 12 to 18 mm. long; fruit oval or oblong, 8 to 10 mm. long, retuse with cordate base; dorsal and intermediate ribs indistinct; wings thin, as broad as body; seed with involute face, rather broad sulcus, and little, if at all, indented beneath the small oil-tubes.

Jalisco: in barranca near Guadalajara, *Pringle* 3864, September 12, 1891, also *Pringle* 7634, June 10, 1898; same barranca, *Altamirano* 19, October 1891, and *Rose* 3057, September 22, 1897; same station, *Rose & Hough* 4820, July 9, 1899.

Pringle 3864 was distributed as a variety of *P. mexicanum*, but it seems to deserve specific rank.

4. *Prionosciadium nelsoni* C. & R., sp. nov.

Coarse herb, 12 to 18 dm. high, somewhat glaucous, more or less branched; basal leaves large, on long petioles (3 dm. or more long), twice pinnate; the primary and secondary rachis with toothed wings; ultimate segments lanceolate, acuminate, sharply and doubly serrate, somewhat puberulent on both sides; upper leaves opposite; upper

flowering branches verticillate; peduncles short; inflorescence pubescent; involucre none; involucre of several filiform bractlets; rays nearly equal, short (2.5 cm. long); pedicels 4 mm. long; fruit nearly orbicular, 6 to 8 mm. in diameter, slightly cordate at base, rounded at apex, pubescent; stylopodium depressed; seed-face with a broad concavity; oil-tubes several in the intervals.

Chiapas: near Tuxtla, altitude 720 to 780 meters, *Nelson* 3079, September 1 to 8, 1895.

Morelos: on bluff of barrancas near Cuernavaca, *Pringle* 6345, June 26 (in flower) and September 18 (in fruit), 1896; same station, *Rose & Hough* 4399, May 27-30, 1899.

This species and *P. pringlei* are the only two described with pubescent fruit. They differ from each other in the shape of the fruit and leaflets, etc.

5. *Prionosciadium megacarpum* C. & R. Contr. Nat. Herb. 3: 308. 1895.

Plant 24 to 45 dm. high, the youngest parts pubescent; leaf segments large (12.5 to 20 cm. long), ovate, crenate, sometimes with two lobes at base, paler beneath; fruit 14 to 20 mm. long, wings much broader than body.

Oaxaca: Sierra de San Felipe, *Pringle* 4688, in 1894; *Chas. L. Smith* 886, in 1894; *Conzatti & González* 305, in 1897.

6. *Prionosciadium mexicanum* (Vatke) Watson, Proc. Am. Acad. 23: 275. 1888.

Angelica mexicanum Vatke, Sem. Hort. Barol. 1876: app. 2. no. 12. 1876.

Somewhat pubescent; leaflets mostly acute; fruit nearly orbicular, glabrous, 10 to 12 mm. long, with wings much broader than body.

Hidalgo: Mineral del Monte, *Ehrenberg*.

Mexico: near City of Mexico, *L. Hahn* 13; *Bourgeau* 571, in 1865-66; *Altamirano* 3, 6, 7, 28, in 1890; *Pringle* 6426, in 1896.

Guanajuato: near town of Guanajuato, *Duges*.

Zacatecas: near Plateado, *Rose* 2752, in 1897.

7. *Prionosciadium pringlei* Watson, Proc. Am. Acad. 23: 276. 1888.

More pubescent; leaflets mostly obtuse; fruit oblong, somewhat pubescent, 8 to 10 mm. long, with wings as narrow as body.

Chihuahua: La Bufa Mt. above Cusihiuriachic, *Pringle* 1249, in 1897.

Durango: *Nelson* 4748, 4971, in 1898.

8. *Prionosciadium madreense* Watson, Proc. Am. Acad. 23: 275. 1888.

Plant 6 to 9 dm. high; leaflets irregularly segmented, the segments narrow, with irregular obtuse lobes, scabrous on the veins as also in the inflorescence; fruit oblong, with wings about as broad as body.

Chihuahua: ledges of river cañon near Guerrero, *Pringle* 1251, in 1887.

9. *Prionosciadium macrophyllum* C. & R., sp. nov.

Glaucous, nearly glabrous throughout, 18–36 dm. high; leaflets (in contrast with *P. madrense*) regularly segmented, the segments ovate, more sharply toothed or lobed; umbel with 8 to 10 nearly equal fruiting rays, no involucre or of several linear bracts, and involucre of several narrow bractlets; rays 20–25 mm. long; pedicels 5–6 mm. long; fruit almost orbicular, 10 mm. long, with wings broader than body, and prominent dorsal and intermediate ribs.

Jalisco: rocky banks of river, Fall of Juananacatlan, *Pringle* 3889, October 6, 1891.

Durango: near El Salto, *Nelson* 4554, in 1898.

Zacatecas: rocky side of barranca near Monte Escabado, *Rose* 3589, August 27, 1897. Differs somewhat from the *Pringle* specimen, which is the type, in having larger leaf-segments and somewhat scabrous inflorescence.

10. *Prionosciadium dissectum* C. & R., sp. nov.

Glabrous throughout; leaves ternate then pinnately dissected; the ultimate divisions narrow, long-acuminate, and laciniately toothed; umbel with 12 to 25 nearly equal fruiting rays, no involucre, and involucre of several linear bractlets; rays 10–35 mm. long; pedicels 2–3 mm. long; fruit oblong, 10 mm. long, the wings about as broad as body or a little narrower.

Jalisco: between San Cristobal and Guadalajara, *Pringle* 3002, August 11, 1889; *Rose* 3000, September 22, 1897; on barranca near Guadalajara, *Rose & Hough* 4809, July 9, 1899.

11. *Prionosciadium durangense* C. & R., sp. nov.

Glabrous throughout; leaves ternate then much dissected; the ultimate divisions shorter than in *P. dissectum* and not acuminate, irregularly toothed or entire; umbel with 6 to 8 nearly equal fruiting rays, no involucre, and involucre of several linear bractlets; rays 15–25 mm. long; pedicels 2–3 mm. long; fruit oblong, 8–10 mm. long, the wings as broad as body.

Durango: Sierra Madre, 15 miles north of Guanacevi, altitude 2250–2550 meters, *Nelson* 4763, August 17, 1898.

Nearest to *P. dissectum*, but with very different foliage.

12. *Prionosciadium watsoni* C. & R. Proc. Am. Acad. 25: 150. 1890.

Peucedanum mexicanum Watson, Proc. Am. Acad. 17: 361. 1882.

Leaflets linear to lance-linear, 5 to 7.5 cm. long, prominently toothed or lobed; upper leaves with prominent scarious sheaths; fruit nearly orbicular, with broad wings.

Guanajuato: near town of Guanajuato, *Rose & Hough* 4840, July 11, 1899.

San Luis Potosi: *Parry & Palmer* 288, in 1878; Las Canoas, *Pringle* 3822, in 1891.

Jalisco: near Plateado (no. 2692), near Mesquitec (no. 2568), near Colotlan (nos. 3595, 3675), mountains west of Bolaños (no. 3706), *Rose*, in 1897.

Queretaro: near San Juan del Rio, *Pringle* 7175, in 1896.

Durango: near City of Durango, *Palmer* 508, in 1896; near El Salto, *Nelson* 4548, 4571, in 1898.

Zacatecas: near Valparaiso, *E. A. Goldman* 13, in 1897.

13. *Prionosciadium linearifolium* (Watson) C. & R. Contr. Nat. Herb. 3: 308. 1895.

Cicuta linearifolia Watson, Proc. Am. Acad. 22: 415. 1887.

Leaflets narrowly linear, 10 to 15 cm. long, serrate, occasionally lobed at base; fruit oblong, with narrow wings.

Jalisco: near Guadalajara, *Palmer*, in 1896; same station, *Pringle* 2298, in 1888; near San Cristobal, *Rose* 3039, September 21, 1897; on barranca near Guadalajara, *Rose & Hough* 4821, July 9, 1899.

14. *Prionosciadium filifolium* C. & R., sp. nov.

Stems rather low, 6 to 9 dm. high, nearly glabrous below, not at all glaucous; leaves large, ternately much dissected into long filiform leaflets (20 to 45 mm. long); the upper ones similar but much reduced, the uppermost opposite; inflorescence much branched, somewhat scabrous; peduncles short (4 to 5 cm. long); rays somewhat unequal, 2 to 13 cm. long; involucre wanting; involucels of several linear bractlets longer than the pedicels; fruit somewhat immature, ovate, glabrous, 7 mm. long; oil-tubes several in the intervals.

Jalisco: on hillsides between Colotlan and Bolaños, *Rose* 2834, September 7-9, 1897.

15. *Prionosciadium tenuifolium* C. & R., sp. nov.

Stems rather low, 6 to 12 dm. high, somewhat scabrous roughened throughout; leaves large, ternately much dissected into linear segments; ultimate segments 10 to 20 mm. long, acute, strongly nerved, scabrous on the veins; uppermost leaves opposite; inflorescence much branched; peduncles short, 1 to 5 cm. long; rays nearly equal, 1 to 1.5 cm. long; pedicels short; involucre wanting or of a few linear bracts; involucel of several linear bractlets longer than the pedicels; fruit immature.

Jalisco: near Huijuquilla, *Rose* 2510, August 23, 1897.

Prionosciadium sp. — ?

Another species was collected at Colomas with large twice ternate then pinnate leaves; leaflets ovate, acute, irregularly serrate, pubescent beneath; inflorescence glaucous; flowers purple.

Sinaloa: *Rose* 1649, July 14, 1897.

Tepic: perhaps also *Rose* 1982, from between Pedro Paulo and San Blaseto, August 4, 1897, is the same.

Prionosciadium sp. — ?

A somewhat similar species, with very large basal leaves ternate then pinnate, the rachis strongly winged and toothed, the leaflets lanceolate and acuminate but pubescent on the lower surface and not at all glaucous.

Sinaloa: above Colomas, *Rose* 1815, July 14, 1897.

These specimens have only leaves, and the generic position is therefore doubtful, but in habit and foliage they are very similar to the species of *Prionosciadium*.

33. **RHODOSCIADIUM** Watson, Proc. Am. Acad. 25: 151. 1890.

A genus of three species endemic in Mexico. In addition to the type species, cited below, two others have been described—*R. dissectum* C. & R. and *R. glaucum* C. & R.

Rhodosciadium pringlei Watson, Proc. Am. Acad. 25: 151. 1890.

Jalisco: *Rose* 2567, August 25, 1897; near Bolaños, *Rose* 2865, September 8, 1897; on barranca near Guadalajara (type locality), *Rose & Hough* 4830, July 9, 1899.

In the collections of 1897, cited above, the specimens differ from the type in having very conspicuous calyx-teeth.

Rhodosciadium dissectum C. & R. Contr. Nat. Herb. 3: 309. 1895.

Oaxaca: Las Sedas (type locality), *Rose & Hough* 4630, June 16–21, 1899.

34. **DEANEA** C. & R. Bot. Gaz. 20: 372. 1875.

An endemic Mexican genus, founded upon two species. The discovery of five additional species gives an opportunity of stating again its relations with allied genera, and is also the occasion for enlarging somewhat the generic boundary. The only boundary that seems to need explicit definition at present is that which separates *Deanea* from *Prionosciadium*. So far as known, these two genera are constantly distinct in their stylopodia, that of *Deanea* being conical, that of *Prionosciadium* depressed. The relative size of the fruit in the two genera, which at first was supposed to be a usable character, is found to be of no avail, as the new species described in this paper exhibit large fruit in *Deanea* and small fruit in *Prionosciadium*. Also the fruit of *Deanea* is found to be not always round or oval, but in some species it is broadly oblong.

When the species of the two genera are contrasted in appearance the difference is greater than can be expressed easily. The species of

Deanea are comparatively small and even delicate, smooth plants, with leaves of moderate dimensions; while those of *Prionosciadium* are large and coarse plants, with very large leaves, which in some species are thickish and rough.

In his presentation of the Umbelliferae in Engler & Prantl's *Natürlichen Pflanzenfamilien*, Drude regards *Deanea* as not generically distinct from *Rhodosciadium* Wats., and transfers to the latter the two species of *Deanea* then published. In our judgment *Deanea* is in much greater danger of confusion with *Prionosciadium*, as stated above, than with *Rhodosciadium*, whose remarkably flat seed-face is entirely unlike the deeply sulcate or involute one of *Deanea*. The genus is further strengthened by the discovery of the five additional species herein described, all of which accord with the essential features of *Deanea* as established.

SYNOPSIS OF THE SPECIES.

Plants with globose tubers and pinnately compound leaves.

D. tuberosa.

Plants with branching roots and ternately compound leaves.

Rachis of leaves conspicuously winged.....*D. glauca*.

Rachis of leaves not at all winged.

Inflorescence comparatively simple, with elongated peduncles;
fruit small, orbicular, 5 to 8 mm. in diameter.

D. nudicaulis; *D. longibracteata*.

Inflorescence widely spreading and irregular, with shorter peduncles; fruit large, oblong, 12 to 18 mm. long and 8 to 10 mm. broad.....*D. diffusa*; *D. montana*; *D. nelsoni*.

1. *Deanea tuberosa* C. & R. Bot. Gaz. 20: 373. 1895.

Rhodosciadium tuberosum Drude, Engler & Prantl. Nat. Pflanzfam. 3*: 223. 1898.

State of Mexico: Valley of Toluca, *Pringle* 4295, in 1892.

2. *Deanea nudicaulis* C. & R. Bot. Gaz. 20: 372. pl. 27. 1895.

Rhodosciadium nudicaule Drude, l. c.

Involucels very small; fruit 5 mm. in diameter.

Oaxaca: Sierra de San Felipe, *Pringle* 4663, in 1894, and *Conzatti & González* 224 and 418, in 1897.

3. *Deanea longibracteata* C. & R., sp. nov.

Stems 6 to 9 dm. high, glabrous, somewhat branching; leaves twice to thrice ternate; leaflets ovate to oblong, obtuse, irregularly cleft or toothed, slightly roughened on the veins; inflorescence simple, terminal or lateral, umbel on an elongated peduncle 3 dm. or less long; involucre a single bract or wanting; bractlets of the involucre 4 to 6, linear, elongated, much longer than the flowers; rays numerous, in fruit 7.5 to 10 cm. long, slightly scabrous as are also the pedicels:

pedicels 6 mm. long; fruit orbicular, 6 to 8 mm. in diameter; seed flattened dorsally, with a broad concavity; oil-tubes solitary in the intervals or often with 1 or 2 shorter accessory ones, 2 on the commissural side.

Federal District: on the Serrania de Ajusco, altitude 3000 meters, *Pringle* 7176, August 18, 1896, also 6674, in 1897.

4. *Deanea diffusa* C. & R., sp. nov.

Stem tall, glabrous and glaucous; stem leaves large, 4 to 5 times ternate; petiole, so far as seen, short, 2.5 to 5 cm. long; leaflets 2.5 to 3.5 cm. long, cleft or strongly toothed and the lower segments again toothed; inflorescence very diffuse, glabrous throughout; peduncles short (2.5 cm. or less long); rays 4 to 6, nearly equal, 12 to 20 mm. long; pedicels 2 to 3 mm. long; involucre wanting; involucre of few filiform bractlets; fruit glabrous; carpels oblong, 12 to 14 mm. long, 8 to 10 mm. broad, cordate at base, with narrow body and broad thin wings; oil-tubes 1 to 3 in the intervals, 6 on the commissural side; seed section nearly circular, the margins strongly involute, inclosing a small cavity.

Morelos: on lava beds near Cuernavaca, *Pringle* 7177, September 17, 1896.

5. *Deanea montana* C. & R., sp. nov.

Stems about 9 dm. high, glabrous, and somewhat glaucous; leaves two to three times ternate; ultimate segments ovate, acute, somewhat irregularly cleft or serrate, glabrous; peduncles usually elongated, sometimes 20 to 25 cm. long, occasionally wanting; rays about 10, 4 to 6 cm. long; involucre wanting or of 1 or 2 bracts; involucre of several linear bractlets; pedicels 4 to 5 mm. long; fruit shortly oblong, about 7 mm. long, glabrous; oil-tubes 3 in the intervals; seed-face concave; stylopodium low and broad.

Zacatecas: on the Sierra de los Morones near Plateado, altitude 2700 meters, *Rose* 3623, September 1, 1897.

6. *Deanea nelsoni* C. & R., sp. nov.

Stems 9 to 12 dm. high, glabrous throughout; leaves 3 to 4 times ternate; ultimate segments ovate, acuminate, sharply and irregularly serrate or cleft; upper leaves mostly alternate; inflorescence somewhat irregular; pedicels short; involucre wanting or of one or more linear bracts; involucre of 5 or 6 lanceolate-linear acuminate bractlets extending beyond the flowers; rays few (4 to 10), nearly equal, 18 to 30 mm. long; pedicels 4 mm. long, slightly scabrous, as are also the rays; fruit strongly flattened dorsally; carpel oblong or slightly broader above, 16 to 18 mm. long, 10 mm. wide, truncate or nearly so at top, slightly cordate at base, glabrous, with narrow body and broad wings; seed-face with strongly involute margins; oil-tubes 3 in the intervals; flowers "dull yellow."

Chiapas: Valley of Jiquipilas, altitude 660-840 meters, *Nelson* 2938, August 16-18, 1895.

7. *Deanea glauca* C. & R., sp. nov.

Stems 9 to 12 dm. high, glabrous and glaucous below; basal leaves very large, once to twice ternate then pinnate, green above, very pale and glaucous beneath; rachis with a broad toothed wing; leaflets lanceolate to linear-lanceolate, sharply serrate, long-acuminate; upper leaves opposite, much reduced, often simple or 3-lobed; inflorescence very irregular, much branched, puberulent; umbels sessile or on short peduncles; involucre of 1 to 3 reduced leaves; involucre of several filiform bractlets; rays 20 to 30 cm. long; pedicels 5 to 6 mm. long; fruit immature, glaucous.

Tepic: foothills between Aguacata and Dolores, *Rose* 2029, August 6, 1897.

Sinaloa: near Colomas, *Rose* 1781, July 20, 1897.

35. ENANTIOPHYLLA C. & R. Bot. Gaz. 18: 55. *pl.* 5. 1893.

A genus which still remains monotypic and restricted to Guatemala, the single species being *E. heydeana* C. & R.

36. COULTEROPHYTUM Robinson, Proc. Am. Acad.
27: 168. 1892.

The discovery of three additional species of this genus, with the same peculiar fruit, confirms its generic rank. As now understood, the species of this endemic genus are as follows:

SYNOPSIS OF SPECIES.

Stems shrubby; pedicels slender; carpophore 2-parted.

Petioles short; leaflets small, ovate, short-acuminate.

1. *C. laxum*.

Petioles long; leaflets large, ovate to lanceolate, long-acuminate.

Ovary and fruit glabrous; involucre of bractlets as long as the pedicels..... 2. *C. macrophyllum*.

Ovary pubescent; fruit scabrous; involucre of bractlets much shorter than the pedicels..... 3. *C. pubescens*.

Stems herbaceous; pedicels short; carpophore 4-parted.

4. *C. brevipes*.

1. *Coulterophytum laxum* Robinson, Proc. Am. Acad. 27: 169. 1892.

Only known from bluffs of the barranca near Guadalajara, Jalisco, where it has once been collected by Mr. C. G. Pringle, September 15, 1891 (no. 331), until the following collection. There is a duplicate type (no 2) in Nat. Herb.

Jalisco: near Tequila, *Rose & Hough* 4756, July 5-6, 1899.

2. *Coulterophytum macrophyllum* C. & R., sp. nov.

Woody stem 9 to 12 dm. long, branches dying nearly back each year; leaves large, 6 to 9 dm. long, twice ternate then pinnate; leaf-

lets ovate to lanceolate, 8 to 15 dm. long, 3 to 7 cm. wide, long-acuminate, rounded and slightly oblique at base or the terminal ones slightly cuneate, somewhat irregularly serrate; inflorescence branching, leafy; peduncles short, 3 to 6 cm. long; involucre of a long linear bract; involucre of several linear distinct bractlets as long as the pedicels or nearly so; rays numerous, 10 to 25 cm. long; carpels 6 mm. long, glabrous.

Tepic: in the foothills of the Sierra Madre between Acaponeta and Pedro Paulo, *Rose* 1936, 1937 (type), August 2, 1897.

Sinaloa: near Colomas, *Rose* 1814, July 14, 1897.

3. *Coulterophytum pubescens* C. & R., sp. nov.

Stems tall (12 to 18 dm. high), weak, much branched; leaves large, once to twice ternate then pinnate; leaflets lanceolate, 8 to 15 cm. long, acuminate, oblique at base, dark green above, pale and puberulent beneath, the margin crenate and apiculate; upper leaves opposite, simple, linear to lanceolate; inflorescence much branched; peduncle 6 to 10 cm. long; rays numerous, nearly equal, 2 to 3 cm. long, puberulent; involucre of several linear short bractlets; pedicels 4 to 7 mm. long; ovary densely puberulent; fruit 10 mm. long.

Jalisco: on the tableland between Colotlan and Bolaños, *Rose* 2863, September 8, 1897.

4. *Coulterophytum brevipes* C. & R., sp. nov.

Herbaceous (?), 9 to 15 dm. high; radical leaves 2 or 3, 9 to 12 dm. long (including the petiole 3 to 6 dm. long), 4 to 5 times ternate; leaflets obliquely lanceolate, 5 to 12.5 cm. long, rounded or somewhat cuneate at base, sharply serrate, acuminate, slightly scabrous on the margin and veins beneath; inflorescence somewhat irregular; peduncles 5 to 15 cm. long; rays nearly equal, 2.5 to 5 cm. long; pedicels very short, less than 2 mm. long; fruit 10 mm. long; carpophore 4-parted.

Morelos: on bluff of barranca above Cuernavaca, altitude 1950 meters, *Pringle* 6390, July 30, 1896.

This species differs from *C. laxum* in the shape of leaflets, more caulescent habit, and shorter pedicels, as well as in its remarkable carpophore.

37. MYRRHIDENDRON C. & R. Bot. Gaz. 19: 466. pl. 32. 1894.

A monotypic genus, found as yet only from the lava beds of Costa Rica. In addition to the original material collected by Mr. John Donnell Smith we cite the following:

Myrrhidendron donnellsmithii C. & R. l. c.

Costa Rica: *Pittier* 2012, June 2, 1890.

38. PEUCEDANUM L. Sp. Pl. 1: 245. 1753.

A very large and polymorphic genus of wide distribution, and represented in Western United States by a peculiar group of numerous species, and perhaps to be excluded from Mexico, but retained here to include *P. tolucense*, cited below, whose generic relationships are doubtful, and also *P. madrense* Watson, a still more uncertain species. Hemsley includes eight species, three of which bear names. Of the named species *P. nevadense* Wats. is included upon the authority of the *Botany of California*, but no collections have verified this statement; *P. mexicanum* Wats. proves to be a *Prionosciadium*; and *P. tolucense* Hemsley is referred to above. The five unnamed species have been variously referred, chiefly to *Prionosciadium*.

Peucedanum tolucense (H.B.K.) Hemsley, Biol. Centr.-Am. Bot. 1: 570. 1881.

Ferula tolucensis H.B.K. Nov. Gen. et Sp. 5: 12. pl. 418. 1821.

State of Mexico: Sierra de las Cruces, altitude 3600 meters, *Pringle* 5953, October 7, 1895.

Hidalgo: Sierra de Pachuca, altitude 2940 meters, *Pringle* 7650, August 13, 1898.

39. DAUCUS L. Sp. Pl. 1: 242. 1753.

A genus of wide distribution, two of which, *D. montanus* Willd. and *D. pusillus* Michx., are natives of Mexico and Central America. In addition to these, *D. carota* L. has become somewhat naturalized. In Hemsley's enumeration these three are given, but his fourth species, *D. brachiatus*, becomes *Caucalis microcarpa* Hook. & Arn.

Daucus montanus Humb. & Bonp. in Schult. Syst. 6: 482. 1820.

Chihuahua: in the Sierra Madre, *Nelson* 4791, August 20, 1898; same region, *E. A. Goldman* 166, September 26, 1898.

State of Mexico: El Desierto Viejo, *Altamirano* 26, July 1890; Sierra del Pino, *Altamirano* 1, September 1890.

Tepic: near Santa Teresa, *Rose* 2126, August 8, 1897.

Puebla: Huanchinango, *E. A. Goldman* 21, January 8, 1898.

Chiapas: above San Cristobal, altitude 2100-2640 meters, *Nelson* 3182, 3236, September 18-22, 1895; about Tumbala, altitude 1200-1650 meters, *Nelson* 3340, October 20-29, 1895.

Guatemala: mountains near Hacienda of Chancol, altitude 3300 meters, *Nelson* 3665, January 2, 1896.

Costa Rica: altitude 1500 meters, *Pittier* 6969, August 27, 1892.

INTRODUCED GENERA AND SPECIES.

The following introduced species have come under our observation.

Aptium graveolens L. Sp. Pl. 1: 264. 1753.

Puebla: in roadside ditches near the city of Puebla, *Pringle* 5956, December 17, 1895.

Conium maculatum L. Sp. Pl. 1: 243. 1753.

Michoacan: Patzonaro, *Altamirano* 22, December 1890.

Coriandrum sativum L. Sp. Pl. 1: 256. 1753.

Chihuahua: Chihuahua City, *Rose & Hough* 4208, May 11, 1899.

Sinaloa: in the market at Rosario, *Rose* 1410, June 20, 1897.

Costa Rica: altitude 1500 meters, *Pittier* 6970, August 27, 1892.

Daucus carota L. Sp. Pl. 1: 348. 1753.

Eryngium foetidum L. Sp. Pl. 1: 232. 1753.

Generally cultivated in tropical America.

Foeniculum vulgare Mill. Gard. Dict. ed. 8, n. 1. 1768.

Puebla: Atlinco, *Nelson*, July 25–August 1, 1893.

Oaxaca: in the valley of Oaxaca, *Charles L. Smith* 887, November 7, 1894.

Petroselinum petroselinum (L.) Karsten.

Apium petroselinum L. Sp. Pl. 1: 264. 1753.

Guanajuato: San Juan del Rio, *Nelson* 3865, May 26, 1896.

Sinaloa: in garden at Colomas, *Rose* 1730, July 14, 1897.

Peucedanum graveolens (L.) Benth. & Hook. Gen. Plant. 1: 919. 1867.

Anethum graveolens L. Sp. Pl. 1: 263. 1753.

Zacatecas: in the Plaza near Monte Escabado, *Rose* 3760, August 26, 1897.

EXCLUDED OR DOUBTFUL GENERA.

CARUM was reported by Hemsley to include a species without name.

The genus should probably be excluded, as the Oaxaca plant cited is probably not a *Carum*.

CRANTZIA has become *Lilaopsis*.

CYMOPTERUS was included by Hemsley upon the authority of a specimen doubtfully named *C. fendleri* Gray, in the Report of the Mexican Boundary Survey. Our present knowledge of the range of that species, however, would suggest that it should be excluded from Mexico. It is very probable that species of this genus may be found along the northern border of Mexico, but none have been reported.

DRUSA may contain a Mexican species, as suggested by Drude, but we have not been able to confirm it.

EULOPHUS was reported by Hemsley as represented by three species.

The two bearing names have been transferred to *Museniopsis*.

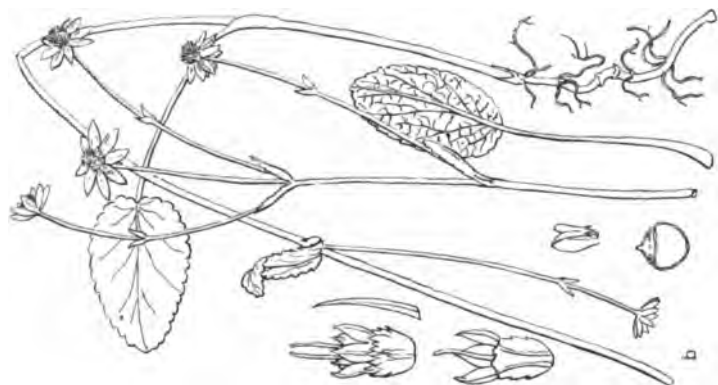
SIMUM is to be excluded, as its single Mexican species, *S. angustifolium*, has become *Berula erecta*.

SMYRNIUM is to be excluded, as its single Mexican representative, *S. agopodioides*, has proved to be an *Arracacia*.

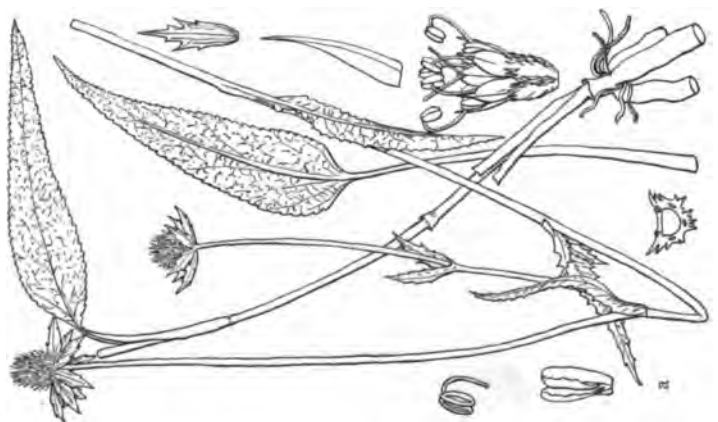
Proc. Wash. Acad. Sci., December, 1899.



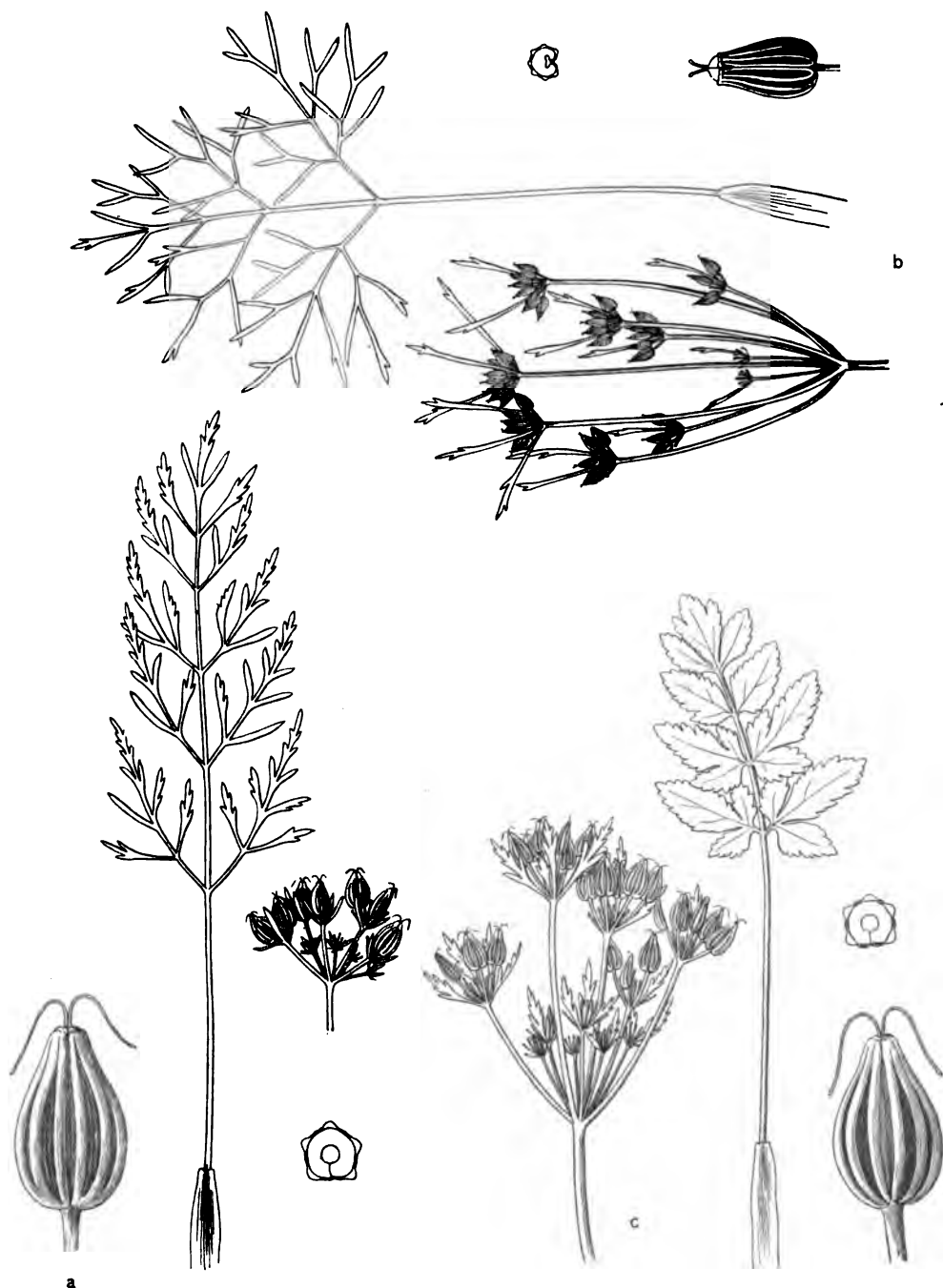
c. *Eryngium spiculosum*.



b. *Eryngium paucisquamosum*.



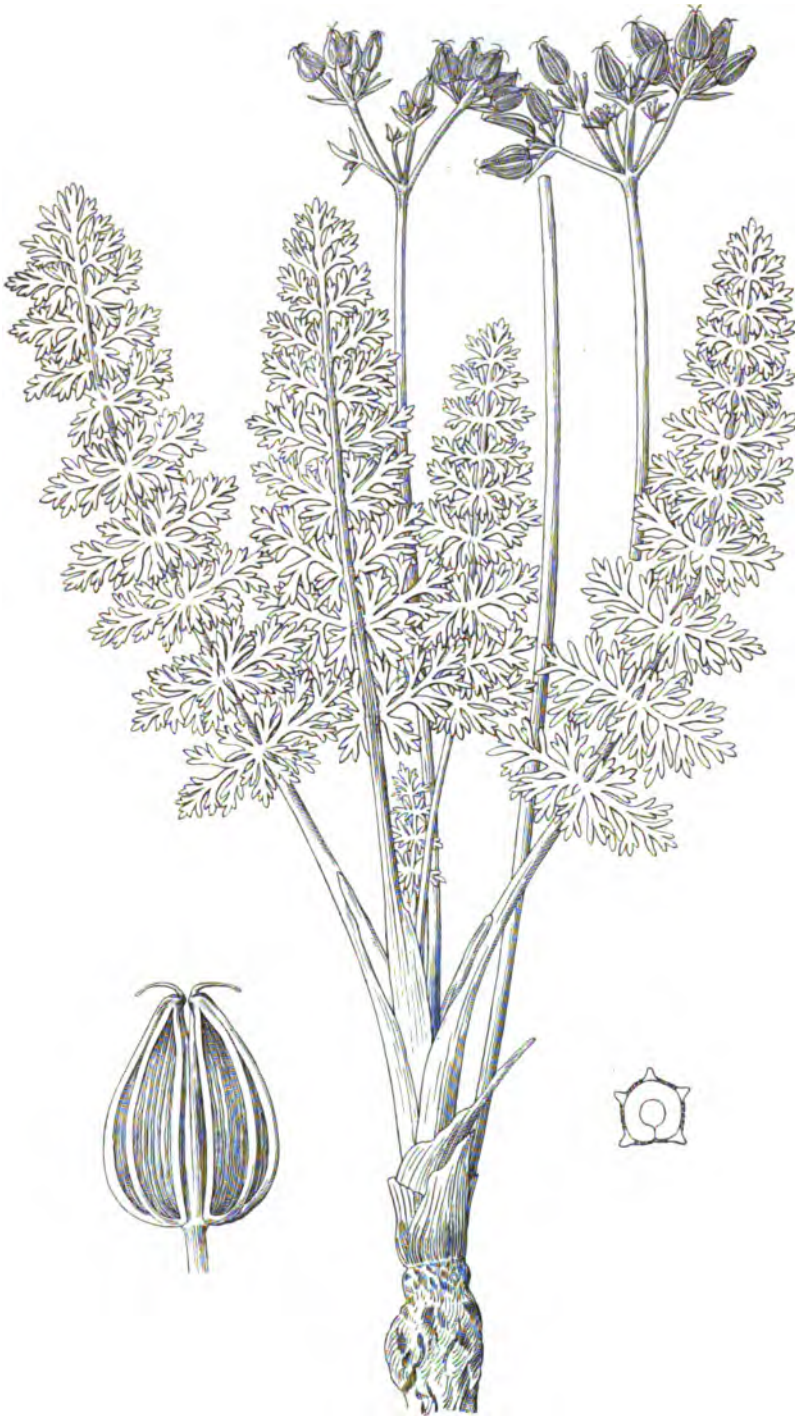
a. *Eryngium galeottii*.



a. *Tauschia mariana*.

b. *T. filiformis*.

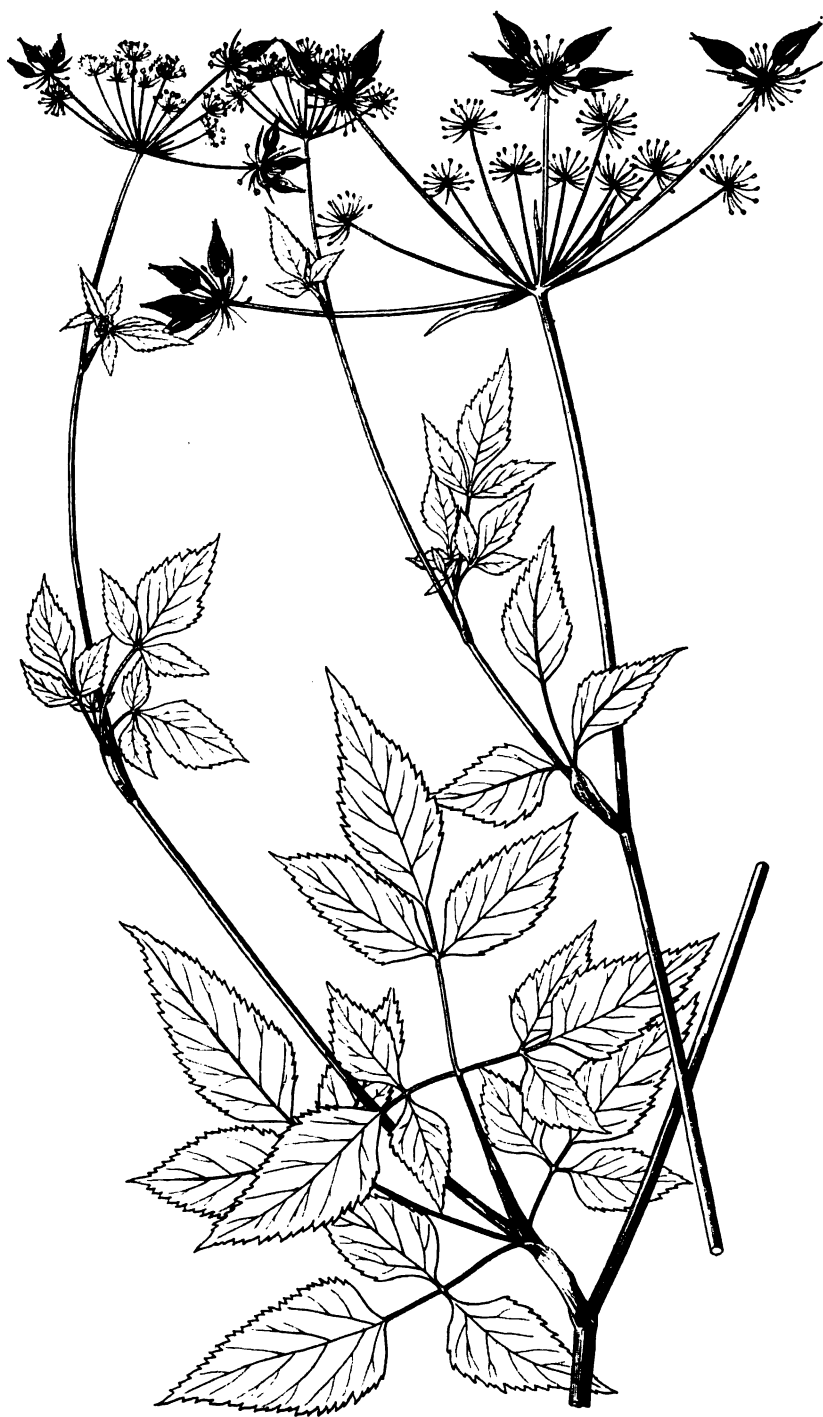
c. *T. edulis*.



Tauschia madreensis C. & R., sp. nov.



Tauschia linearifolia C. & R., sp. nov.



Arracacia chiapensis C. & R., sp. nov.



Arracacia dugesii C. & R., sp. nov.



Arracacia hemsleyana C. & R., sp. nov



Arracacia longipedunculata C. & R., sp. nov.



Arracacia aegopodioides.



Arracacia toluensis.



Arracacia toluensis.



